OCT 20 1930

HYGEIA

THE HEALTH MAGAZINE

PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION

OVEMBER, 1930 25 CENTS

IGHTENED PARENTS ANOTHER LOST BATTALION

MELLIN'S FOOD

ACCEPTED AMERICAN MEDICAL ASSN. Committee on Foods

A Milk Modifier

for the feeding of

Infants of Any Age

Mellin's Food supplies the need for sugar in maintaining body heat and energy.

Mellin's Food furnishes important mineral salts for bone building.

Mellin's Food makes the curd of milk soft, flocculent and easily digested.

Babies fed on milk properly modified with Mellin's Food are not troubled with colic or constipation, digestion proceeds normally, they gain in weight with regularity and their general development is progressive and satisfactory.

Mellin's Food meets all the purposes of a milk modifier

Write today for a Free Trial Bottle of Mellin's Food and a copy of "The Care and Feeding of Infants"

Mellin's Food Company, Boston, Mass.

HYGEIA, the Health Magazine, is published monthly by the American Medical Association, 535 North Dearborn Street, Chicago, Ill. Yearly subscription price, $3.00; for foreign postage add 50 cents. Volume 8, Number 11. Entered as second-class matter March 21, 1923, at the postoffice at Chicago, Ill., under the Acts of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1,103, Act of October 3, 1917, authorized March 21, 1923.

HYGEIA

THE HEALTH MAGAZINE

Published by the American Medical Association
Edited by Morris Fishbein, M.D.

VOLUME 8 — NOVEMBER, 1930 — NUMBER 11

TABLE OF CONTENTS

COVER DESIGN
Edithe Lawson Swanson — PAGE

THE ROADS TO RUIN 1000

MODERN PARENTS ARE FRIGHTENED PARENTS 1001
Jessie C. Fenton

ANOTHER "LOST" BATTALION 1004
Henry Pleasants, Jr.

DR. SEDGE BEGINS HIS PRACTICE 1007
Grace C. Newton

PROTECTING THE CHILD FROM TUBERCULOSIS 1009
J. A. Myers

SENSIBLE DRESS FOR NURSERY FOLK 1013
Jesse R. Gerstley

THE STORY OF ANESTHESIA 1014
John H. Evans

PHYSICAL ILLITERACY 1018
James Edward Rogers

MINERAL SPRINGS OF SOUTH AFRICA 1020
C. H. Hamilton

TONY DID NOT FORGET 1022
A. F. Tyler

FOR LITTLE BOYS 1023
Sara Henderson Hay

PAGE

THE MENACE OF THE RAT 1024
Louis Gershenfeld

TEACHING HEALTH TO 10,000 CHILDREN 1029
Martha C. Allis

WARNS AGAINST NEW ANTIFREEZE MIXTURE FOR MOTOR CARS 1032

HOW OUR SENSES HELP US 1033
William J. Mayo

SIMPLE LESSONS IN HUMAN ANATOMY—LESSON XVI. THE GLANDS OF INTERNAL SECRETION, OR PHARMACIES WITHIN THE BODY 1037
B. C. H. Harvey

WE SHALL ALWAYS NEED THE FAMILY DOCTOR 1043

HEALTH PURSUITS IN PICTURES 1044

THE STORY OF APRIL BLUE 1047
Elizabeth Blaine Jenkins

THE JOLLY SMILES CREW 1050
Wanda B. Longacre

HEALTH AND THE SCHOOL 1053
Edited by J. Mace Andress

NEW BOOKS ON HEALTH 1057

QUESTIONS AND ANSWERS 1058

Contributors to This Issue

JESSIE C. FENTON, whose work has frequently appeared in HYGEIA, is author of a book entitled "A Practical Psychology of Babyhood" and is co-editor with her husband, Norman Fenton, of the *Journal of Juvenile Research.*

From the intimate knowledge displayed by DR. HENRY PLEASANTS, JR., concerning the activities of the army sanitary corps, one suspects him as one of the characters of his absorbing narrative. GRACE C. NEWTON writes her sympathetic sketch of young Dr. Sedge from Beaumont, Texas.

DR. J. A. MYERS has written much for HYGEIA, notably a series on tuberculous physicians in 1928. DR. JESSE R. GERSTLEY is the children's physician who wrote in HYGEIA last March of his war experiences with epidemic meningitis.

DR. JOHN H. EVANS, an instructor in anesthesia for seventeen years, has occupied many distinguished positions in organizations of anesthetists and is at present chairman of the board of governors of an international society for research in this phase of medicine.

JAMES E. ROGERS, as head of the division of the National Education Association devoted to school health and physical education, is constantly studying the problem he discusses in this issue. In this era of telescoped distances South Africa appeals to many travelers. C. H. HAMILTON's article presents an inviting picture of that little known land.

DR. A. F. TYLER brings hope for cancer sufferers through the use of the x-ray—if the disease is discovered in time. LOUIS GERSHENFELD, professor of bacteriology and hygiene at the Philadelphia College of Pharmacy and Science, writes entertainingly on many subjects. A valuable article by him on snake poisoning appeared in HYGEIA for August, 1929.

MARTHA C. ALLIS is associated with the Pulaski County Tuberculosis Association which sponsored the program of which she writes. DR. WILLIAM J. MAYO is internationally known as a surgeon.

In this issue DR. B. C. H. HARVEY presents the first section of the last article of his series of lessons in anatomy. The series, which has attracted much attention, will be concluded in December. HYGEIA's child readers have this month a new type of story picturing life among the Gullah Negroes of South Carolina, by ELIZABETH BLAINE JENKINS. WANDA B. LONGACRE is a member of the health education department of the state teachers college at West Chester, Pa.

Published monthly by the American Medical Association, 535 North Dearborn Street, Chicago. Subscription price $3 a year. Single copies 25 cents. Foreign subscriptions $3.50 a year.

Copyright, 1930, by the American Medical Association. All rights reserved.

The Roads to Ruin

An Editorial

THE paved roads of the nation stretch glisteningly from village to village, from city to city, over the rivers and through the woods. On week ends and holidays the white of the concrete is well-nigh obliterated by long miles of shining gasoline-propelled vehicles in which everybody is going somewhere. Never in the history of our country have Americans been such a restless people. Moreover, never in the history of our country have so many Americans been distributed unconscious, semiconscious or shrieking with pain along the roadside. In the vast majority of instances the accidents responsible for the mutilations and mortality may be considered preventable. In many instances, however, they seem to be the results of a combination of circumstances that might be called an act of God.

Certain rules of the road should by now be familiar to every one. If a driver is sensible, he does not attempt to pass another car going in the same direction while going up a hill or while going around a turn. If he is at all careful, a driver will invariably slow down while making a turn, even on a well paved road. If he has any respect at all for his own health and that of his co-tourists, he will diminish his speed at least one third, if not one half, when the skies are drizzling and the road is moist. He will see to it that his windshield is clean and that his windshield wiper gives him clear vision in wet weather. He will not attempt to drive through a train that is crossing the road, or to cross the railroad tracks in front of a train if the train is in motion. He will keep his mind on his work and both hands on the wheel most of the time.

HOWEVER, with all of these precautions, the conditions of congestion, the nature of the construction of our roads, the increased speed and pickup of the motor cars being built each year, inevitably tend toward more and more accidents and toward greater possibility of loss of life.

In the midst of these conditions, the wise motorist will make certain preparations for the accident that seems bound to occur regardless of his carefulness. He should have in his car a first-aid kit containing a liberal supply of sterilized bandages; an antiseptic, such as mercurochrome or tincture of iodine; enough adhesive tape to cover an entire arm, or a back or a leg; a tourniquet to stop the flow of blood; scissors for the removal of soiled garments, and for cutting bandages and tape; some safety pins and perhaps some aromatic spirits of ammonia for help in stimulation and in restoration of consciousness.

SEVERAL foreign governments have already begun to take steps for the provision of regular first-aid stations along much traveled roads so that persons who are injured may receive prompt attention. With the number of first-class gasoline stations now available in this country, it should be possible to provide similar first-aid stations along our most traveled thoroughfares. However, regardless of the ability in first-aid measures possessed by any member of the party or by any untrained individual in charge of a first-aid station, there is just one safe procedure in time of accident. The persons who are injured should be placed in the hands of a competent physician at the earliest possible moment.

A competent physician will not attempt to relieve a wound by punching the back or by resorting to prayer. A competent physician will not pull or distort a limb that may be the subject of a dislocation or of a fracture, without first obtaining an x-ray picture so that his movements will be intelligent. A competent physician will carefully examine every portion of the ailing body in order that he may not overlook the rupture of some internal organ, damage to the heart or the glands, or to the system generally. He will make a careful examination of the blood and of the mental reactions. He will view the person who is injured not merely as a fracture, a dislocation, or a wound, but as a human body and mind which have undergone a dangerous experience. The writer of these lines speaks from personal experience—prompt care of the right kind means the difference between life and death.

MODERN PARENTS ARE *Frightened Parents*

Says

Jessie C. Fenton

Conscientious parents worry over a thousand bits of childish behavior that are perfectly normal and natural.

BRINGING up children is the oldest occupation in the world, but only recently have parents in general become self-conscious about it. Parenthood used to be taken for granted; it was a more or less casual affair—nothing to get excited about. Any one could be a parent. That was simple. If one kept his children fed and clothed, gave them some schooling and enough spankings to put the fear of the Lord into them, one was entitled to feel quite comfortable and complacent in the assurance of duty well done.

But now—how different! Parenthood is suddenly discovered to be, not a casual, everyday, more or less instinctive and natural sort of affair, but a matter of intricate and difficult problems, calling for skill and training. It has been called successively a craft, an art, a science, a profession. Bringing a child into the world can no longer be regarded smugly as an act of virtue; it is now a responsibility, and of the gravest.

The Objective Is Happy Children

Now this is very fine; indeed our age has produced no development finer than the newly awakened consciousness of the difficulties and subtleties of parental responsibility. But it is unfortunate that the matter should have been made so alarming, a subject for so deep a concern. For the consciousness of the modern parent has become so obsessed with problems that there is danger of his losing sight of what should be, certainly, one of the fundamental objectives —if not the fundamental objective—of parenthood. And that is happy children and the enjoyment of them.

Frightened parents cannot have happy children, and modern parents are badly frightened. So many experts have presented so many problems that parents are coming to inspect with a foreboding heart every slightest lapse from perfection of their offspring, wondering if it be, perchance, the fateful beginning of one of the numberless maladjustments that are so portentously described in scores of magazines and books and proclaimed from lecture platforms on every side.

Don't Know What to Expect of Their Children

The literature of child care has been too full of warnings about what to avoid and has given too little information about what to expect in one's children. The abnormal has been overemphasized, and parents—the conscientious kind of parents, that is, who read books and go to lectures for help in their difficult and important profession—are becoming almost morbidly introspective. That's not good for them; it makes them unhappy, and what is worse, it makes their children unhappy too.

I have been giving lectures to young mothers about child care myself (perhaps a guilty conscience is driving my pen as I write) and I have been appalled at the anxiety, the concern, with which these conscientious parents come to me after each talk to tell me of their worry over a thousand bits of childish behavior that are perfectly normal and natural. One mother is all but in tears because her 7 year old

doesn't always hang up his clothes as she has taught him to do—what 7 year old ever did? Another is miserably sure she has failed in her great parental mission because her daughter, aged 3, serenely disregards announcements of dinner-time and bed-time. And so it goes. It is appalling what parents are expecting of their children, and how they are worrying when the children fail to meet these expectations.

Copy Writers Spread Terror

It seems that all writers are in a conspiracy to alarm parents. We have learned that children cannot be guided through fear, but the best of psychologists are still trying to frighten adults into avoiding some of the old parental faults. Even the advertisers add their influence to developing a reign of terror for parents. In a recent issue of a magazine for parents I found the following captions for advertisements:

Don't Take Such a Chance with Your Child!
Your Baby's Health Depends on It!
Is Your Child a Lucky 6-Year-Old?
Baby Experts Say:—

At the heart of every one of them is the subtle appeal to fear—that keen and merciless terror of parental hearts lest the child, the infinitely precious center of parental concern, be even in slight degree deprived of the attainment of that ultimate perfection which every parent so passionately desires for him. It is bad enough that parents should be thus terrorized, but their fear and worry lead them to nag and harass their children, and that is worse.

For, after all, there is not one single thing that is more important, more absolutely essential, for children than to be happy! And no matter what care parents may take to avoid and to overcome the faults and maldevelopments of their children, their care will be worse than wasted if by their very concern they rob their children of happiness.

Happiness is by no means a negative thing, the residuum that is left when griefs and perils are eliminated; it is something positive in itself, to be built up not by avoidances but by achievement, not by lack of harm but by definite attainment of good.

Children cannot be entirely happy, of course—probably no one can. Happiness is an elusive thing; men have been trying throughout the ages to define it, and it is still undefined; to attain it, and can still give no rule by which it may be encompassed. For children no less than for adults, indeed, the world presents many griefs, none the less poignant because seen through the perspective of adult eyes they may appear as trifles. Christopher Morley has phrased the matter gracefully thus:

> The happiness of children . . . do not speak
> That nonsense where a parent may o'erhear—
> He knows that still, on childhood's gayest cheek,
> There lingers a bright tear.

Granted that happiness is never entirely attainable, granted that it defies exact description, nevertheless there are certain ingredients of happiness for children that may be listed, and even if still the subtle essential flavor may be lacking, nevertheless the recipe may make a wholesome and a satisfying dish.

Health is of course an essential ingredient, but we will take that for granted; it is the mental and emotional elements that we shall especially consider. These may be divided, roughly, into three groups—intellectual, social, emotional. Among these there is much overlapping, but for convenience' sake, the classification will serve.

The Wholesome Gift of Wonder

In the first category, intellectual, we should have such items as interests, activities, adequate stimulation, curiosity. The happy child is not bored; he has plenty to do, to investigate, to learn about, to handle. His parents, by suggestion and example, foster his natural enthusiasm for discovery, for mental activity. They encourage him to feel that the world is, indeed, full of a number of things, and that learning about them is supreme fun. They never minimize his childish discoveries; they never say "Of course!" or "Every one knows that!" When he discovers some tremendous trifle they applaud, they share his excitement, they urge further intellectual venturings. They are careful not to suggest boredom, never to hint that mental activity is commonplace or tiresome. But they let the child himself set his own pace; they suggest, but do not force; they applaud, but do not urge. It is too bad that we grown-ups let the world grow commonplace, that we so often lose completely the wholesome gift of wonder; but let us at least do what we can to help our children find joy in mental exercise and to keep alive their natural tendency to look with won-

Feeding, clothing, schooling and spanking used to constitute the parent's obligation to the child.

dering and admiring eyes upon the intricacies of this diverse and challenging world.

The happy child never lacks for activity. He has toys that he can do things with, that challenge his imagination and his constructive energy. He has a chance to try his hand at many types of playful activity; his toys include tools, the implements of art, and a variety of raw materials—wood and sand and water and clay and earth and fire—everything that hands may shape and imagination fashion into new forms. Childhood is the time for much tasting and trying of this and that, and the happy child does not lack for possibilities of new experience.

Of all his toys, his best is curiosity itself, that inborn urge to mental manipulation of all the facts of his constantly enlarging universe. It is his most precious heritage, not alone for usefulness and achievement but for joy.

The happy child has friends and a chance to learn, without undue adult interference, the give and take of easy-going, unself-conscious contact with his fellows. The earlier and the freer are his opportunities for wholesome social contacts, the easier will it be for him to fit well and comfortably into a world that is full of other people.

Of all his toys, the best is the child's curiosity, that inborn urge to mental manipulation of all the facts of his constantly enlarging universe.

In the realm of emotion, the items necessary for happiness are varied and subtle. Security is an important one; the happy child never doubts that he will be cared for, and that he is wanted and loved. Despite all the discredit that the Freudians have of late cast on the ancient and honorable emotion of love, despite the warning tabu on parental affection that Watson and his followers would urge, it remains nevertheless as true as it has always been that a child requires love as a plant does water for its complete and perfect blossoming. The child needs to feel that the essentials of his world, his home and family, are stable and secure and will not suddenly or lightly change.

His own status in his familiar microcosm he likewise feels to be secure and fixed; he is able to esteem himself and to know that he has a place in the esteem of others. For no one can be happy unless he feels himself to be worth while. This feeling his parents give him by their love, their consideration, their praise, by their acceptance of him on the same plane as any other human being, not belittling or disparaging him because he happens to be a child, nor yet on the same account elevating him to a false position of specialized attention or concern. He suffers from either attitude.

The happy child is to himself and to his parents primarily a human being, and only secondarily and incidentally a child. And occupying this position he suffers neither from feelings of inferiority nor of superiority, either of which is hampering and unwholesome. He is not unduly introspective, because he has no need to be. Feeling himself secure and at ease, he is free from personal worry and can look objectively out into the interesting world about him, rather than turning an unhappy inward gaze into the obscurities of his own nature.

Above all, the happy child is allowed to be himself. His parents understand that it is their function to provide him with opportunities for experience, to suggest and encourage and stimulate, but not to form. They do not try to make him over into some special sort of creature that fits their own preconceived notion of the kind of child they might prefer to have. They take him as he is, an individuality, a personality in his own right, for whom it is their pleasure as well as their duty to provide opportunity for such development as his own nature may decide.

Final Flavoring a Matter of Taste

These are the essentials. Upon the basis of this master-recipe may be devised many variant forms of happiness, with a diversity of added condiments and spicings. Just what additional items need to be added no two persons would agree. The final flavoring is a matter of taste, and not subject to discussion. But in any case, the child who possesses these things will have the basic parts of happiness, and without them, the cup of life must present to him a flat, if not a bitter taste.

Another "Lost" Battalion

By Henry Pleasants, Jr.

EVERY well read and patriotic American knows of the heroic stand made by the famous battalion of the 308th Infantry under Col. Charles Whittelsey when surrounded by Germans in the thick of the Argonne forest. The example of courage and fortitude given by those brave men stands out as one of the greatest incidents of the World War history.

There was another battalion in the A. E. F. whose deeds have never been brought to the attention of their fellow countrymen as they deserve to be—first, because their work was not in the least spectacular or romantic; and, second, because from an official standpoint the status of the organization as a military unit was somewhat vague.

Now that the deeper subjects of the war are being studied and discussed, it is right that the men who served with this battalion, which has been "lost" officially for many years, be given the credit due them for the splendid part they played in prevention and control of disease in France among the American troops both at the front and behind the lines. I refer to the sanitary squads of the A. E. F.

During the mobilization period of 1917 there was an effort on the part of the War Department to emulate the schemes of the other countries whose experience in the war was greater than our own.

The British forces in France had developed a system of military sanitation that had proved highly successful. Much of the best work had been done by what were known as sanitary squads, small units of men trained in military sanitation who accompanied the larger units in the trenches and training areas and kept close supervision of the water supplies, food handling and disease conditions in the areas occupied by the troops.

Observers for the United States on duty with the British forces were impressed with the value of such a system, and as a result of their recommendations a general order was issued that each combat division then in training in the United States should form two squads of twenty-five men of high type of intelligence under the command of a medical or sanitary officer. These squads were to remain with the division at all times and be utilized in the prevention and control of disease conditions, but were not to be considered as labor troops or scavengers.

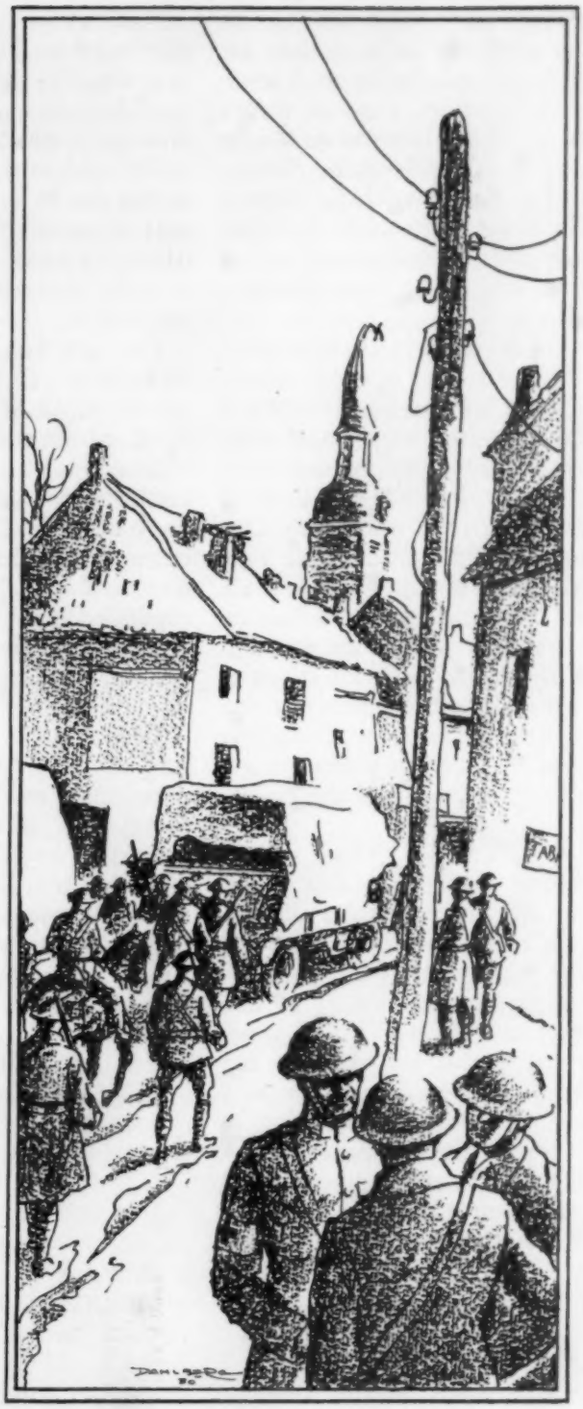
Unfortunately, when the official table of organization was issued the sanitary squads were left out. This error caused much confusion for the reason that the line officers, being terribly busy and harassed by endless details of their own work, did not understand the importance of this branch of medical work, and furthermore did not intend to render any material assistance to an organization that had not been given official standing in the tables of organization. In addition to this the line officers were likely to be hostile to the inspectorial work of the medical department in mat-

He laid down an official looking requisition signed by himself and walked out of the office with the gendarmes standing at attention.

ters of sanitation, and were glad of any opportunity to foist onto the sanitary squads of their division any disagreeable labor duty that they possibly could.

When the divisions moved, the poor sanitary squads were often totally forgotten, as a result of their absence from the official table of organization, and would tag along under indefinite orders until the division came to rest. Wherever they landed they would be promptly assigned to disagreeable tasks until they were rescued by the division surgeon and given a proper status.

The first real recognition of the mission of the sanitary squads was given by the division surgeon of the 77th Division, Col. Charles R. Reynolds, who was later appointed chief surgeon of the Second Army. The two squads, whose personnel had been most carefully selected from educated men, had established themselves in billets in a quaint little French town, Nordausque. In order to improve their time while awaiting orders to accompany the division to the front they had made a few models of sanitary contrivances out of salvaged lumber and old iron. The division sanitary inspector was so impressed with the value of this bit of constructive work that he suggested to the division surgeon the practicability of allowing the two squads to establish a small school of military sanitation for the benefit of the medical personnel of the combat regiments. The idea was put into effect immediately, much to the delight of the two orphan units which now felt that their training and enthusiasm had at last been recognized.



There was constant movement of green troops in and out of the billets.

When the 77th Division moved into its own sector of the front the division sanitary inspector was faced with several problems. In the sector were perhaps twenty tiny towns, each having a normal population of from 50 to 200 persons. Detachments and companies of the troops were billeted in these little towns occupying deserted horse and cow stables or vacant rooms in shattered buildings. The accommodations for troops in each town were accurately estimated, and in all cases a junior line officer was semipermanently stationed in the town to keep a record of the troops and provide accommodations. With such constant movement of green troops in and out of the billets, it was next to impossible to keep anything like accurate check on infringements of sanitary discipline. To make matters worse there were several battalions of French troops in the area, and of course any irregularities that occurred were laid to their door by the commanding officers of the units of the American forces, and no disciplinary action could be taken. The old army game of "passing the buck" reached its highest stage of perfection, much to the disgust of the medical department.

The division sanitary inspector studied the situation with considerable care, and decided that as long as he was unable to divide himself into some twenty or thirty equal parts for the purpose of inspection he would give his trained sanitary squads a chance to prove their worth. Under orders from the division surgeon the two squads were assigned to him and put under his direct control. One of these was given the supervision of the sanitation of the sector.

Each enlisted man was stationed in one of the little towns as a special sanitary inspector for that town. His function was to see that the billets were kept in good order by the troops; that an adequate supply of chlorinated water was kept on hand for transient troops; that dis-

ease conditions among the civilians were reported to the proper authorities, and that an adequate system of disposal of waste and sewage was maintained. This man was to make daily reports directly to the division sanitary inspector and to the billeting officer, or "town major," under whom he was working. Being an enlisted man he had no authority to issue orders but was to recommend to the unit commanders what was necessary to be done toward improvement of conditions.

The second squad was divided into three sections. One of these was composed of carpenters, plumbers and laborers, who established their headquarters near the division salvage dump. Their task was to improvise suitable sanitary contrivances out of discarded materials and to send these forward for use in the little towns supervised by their colleagues. The other two sections of this squad were composed of men of somewhat higher education and were assigned duty in the two delousing stations for the purpose of detecting cases of skin disease among the troops and assisting the enlisted men of the quartermaster department in handling the details of the stations. Certain picked men of the two squads were given special duty.

The Private Listens Respectfully

An interesting incident occurred soon after the squads had taken up their various duties. An epidemic of malaria broke out in the troops in the trenches, and the division sanitary inspector became immediately suspicious of the presence of anopheles mosquitoes in the stagnant water in shell holes and open drains. He visited one of the towns near the front line and interviewed the private who had been assigned to duty as sanitarian there. He explained carefully how necessary it was to secure samples of the stagnant water that contained wrigglers, or mosquito larvae. He went on to explain how malaria was transmitted by the anopheles mosquito. The private listened respectfully to the talk and then remarked: "I think I may give the captain a little help in this. I was in charge of the mosquito research work at the Rockefeller Institute before the war." Needless to say, this man was immediately put in charge of the entire investigation, and amid strong protests from the French most successfully demonstrated the presence of large numbers of anopheles mosquitoes in the sector. It was not long before the malaria was under full control.

The pride that these young soldiers took in their work was really refreshing. They had no actual authority, and their status was that of ordinary enlisted men, but the Red Cross brassards on their arms inspired a little respect in the eyes of the doughboys; and their mysterious lack of connection with the regimental medical units coupled with their evident sanitary training caused them to be treated with reasonable consideration by the officers. In a short time the boys had won their spurs by reason of the remarkable improvement in the conditions in the shell-torn towns. Respectable latrines and shower baths appeared miraculously. Disreputable and lousy bunks were replaced with clean ones; the infected wells were posted or boarded up; stagnant pools were drained, and countless other little details that made for comfort and health among the tired doughboys were attended to.

One incident in connection with the resourcefulness of the American soldier stands out as an example of what these boys could do. There was, of course, a great dearth of lumber in France. The engineers moved heaven and earth to get enough timbers for the most necessary construction work. All that they obtained came from the French lumber dump, which was guarded day and night by gendarmes and enclosed in double thickness of barbed wire. Stealing lumber was almost a capital offense.

A Zealous Sanitarian

One day the division sanitary inspector visited one of the towns in which a young Italian-American sanitarian was in charge. The first thing that struck his eye was the number of pieces of brand new construction work that had sprung up since his last visit a few days before. Being suspicious that the zealous sanitarian had in some manner filched this lumber from the French, he questioned him rather sharply but received an indignant denial. On further questioning he found that the boy had deliberately walked into the sanctum of the chief of the French engineer troops in the area, and with a quiet air of a lieutenant-general had demanded that a certain definite amount of lumber sufficient for his needs in the town be immediately delivered there by the French. He then laid down an official looking requisition list signed by himself and walked out of the office with the gendarmes standing at attention. The following day more lumber was delivered in that one little miserable town than had been delivered to the whole 77th Division in three weeks!

One case of true typhus fever developed in one of the artillery batteries. It was probably one of the few cases among American troops in France, and its occurrence caused much anxiety in the medical department. A special detail of enlisted men of the sanitary squads took entire charge of the situation and supervised the quarantining of the battery in "pup" tents on an isolated hill back of the lines. Each day members of the detail under a medical officer gave the entire battery a bath with an improvised shower and saw that each artilleryman was carefully rubbed with kerosene. For two weeks this close quarantine was kept up, and possibly as a result of their efforts there were no other cases of typhus in the division.

The success of this system of area sanitation was so pronounced that the news reached the ears of the commandant of the Army Medical School at Langres, and a class of medical officers was sent down to study the system first hand. This pleased the boys immensely.

When the division moved into a more active sector along the Vesle River following the retreat of the Germans from the Chateau Thierry "show" the sanitary squads found a greater problem confronting them. Here the towns were in terrible condition and the pollution of the water brought on an epidemic of dysentery, which taxed the hospital resources to the maximum. But the same principles held good and the squads fell to work as before, this time in securing burial details and providing chlorinated water for the troops. At times they found themselves drawn into more active medical work under shell fire, but their slogan of "clean up" was carried out in spite of difficulties. It was not long before order came out of chaos, and disease conditions began to improve.

During the weeks that the 77th Division held a strong position along the banks of the Vesle River the resources of the medical department were taxed to the utmost. The Germans, being familiar with every inch of ground occupied by Americans, proceeded to pour into the sector a withering shower of high explosive and poison gas. By day and night every cross-road or small town was shelled or bombed. The harassed line officers had little time to bother about sanitation, and the personnel of the field hospitals and ambulance companies were literally run off their feet.

One night, following a particularly heavy drenching of the front line troops with mustard gas, the strain on the litter bearers of the field hospitals became so great that many of them fell exhausted, and their places were taken by medical officers ranging in rank from lieutenant to lieutenant-colonel. To help in this extreme period of necessity one of the sanitary squads was called in for hospital work.

(To be concluded in December.)

Dr. Sedge Begins His Practice

By Grace C. Newton

THE rain was falling at last, straight and monotonous, and the snow, which had lain thick for four days, was fast being reduced to a miserable thin slush through which the black earth could be seen in ragged patches. Here and there dead corn stalks thrust themselves up like lost old men wandering over the fields. It was still fairly light, but a flickering orange square cutting through the blanket of rain betokened a lighted lamp in the grocery. The thin little grocer with blond curls circling his red old face would no doubt be hugging his stove now with a few of his cronies, dividing his attention between them and a barrel of wormy apricots.

"A country doctor!" Arthur Sedge groaned aloud and kicked his medicine satchel under the desk at which he was seated.

"It's my wife—very sick."

It would have been a task for his friends to identify this solemn, dull-eyed fellow who frowned as he watched the rain with the eager, smiling young doctor who a week ago, with his medical school days fresh in his mind and the praises of his professors and friends still pleasantly in his ears, had come to establish his practice in this out-of-the-way village.

The young doctor had entered upon his duties with a fine enthusiasm. On the first day he himself had washed and shined every pane in the six wide windows of the consulting room, had taken down the frilly curtains and substituted heavy tan shades like those used in a laboratory, and had drawn the large desk from its dark corner

and placed it between the two side windows where the light was better. On the wall to the right he had built a small shelf on which he kept a few important books including his own much prized thesis, "Study of the Rat's Viscera in Health and in Disease," bound in pale yellow and standing shyly between the more ponderous volumes. After he had finished, he buttoned on a white starched smock over his shirt. He liked the stiffness of it and the little choking jerk it gave when he sat down suddenly.

With everything thus scientifically ordered, he had calmly disposed himself to await his patients.

But no patients came.

To be sure, there was that tearful woman who had brought her sour-smelling little boy to have a thorn plucked from his finger. Dr. Sedge had tried to give him a bath and had nearly come to grief at the hands of his mother. Then one of the grocer's cronies had had a coughing spell and when Dr. Sedge ordered him to breathe through his nose and drink six glasses of water a day, he sniffed something about learned doctors and went away without paying his fee.

Not as Sedge Had Pictured It

Sedge had imagined it all so different in his student days, while he worked at his experiments, removing pieces of viscera from the clear alcohol, scraping off a few cells with his scalpel, preparing a slide, and then clamping it onto the stage of the microscope.

"You make careful observations," the professor would remark, looking at his work; or, "You will be a great specialist some day, Sedge."

"A great specialist in a hole like this!" he groaned aloud and crumpled up the papers before him. The room was growing cold and dark. He had deliberately let the fire go out and had not bothered to light the huge oil lamp.

Suddenly he sprang up. "Why do I stay here? I was meant for big things! I won't waste my skill in this forgotten place!" He ripped off his smock, got into his overcoat, and began cramming his instruments and books into his satchel.

The early spring rain had brought with it an iciness that cut Sedge to the marrow as he stepped, satchel in hand, out on the porch. A sharp wind had also risen and it almost tore the door from his grasp as he locked it behind him. He was turning the key, when he heard a horse come slushing up the road and stop in front. He turned about, to see a man with a lantern striding clumsily up the path with a cumbrous bundle.

The Man with the Bundle

As the man approached, the flickering rays of the lantern showed him to be a young fellow, lean and muscular. By his thick jaws and blunt expression, Sedge took him to be one of the young farmers from a German settlement near by. He had reached the steps before he saw Sedge.

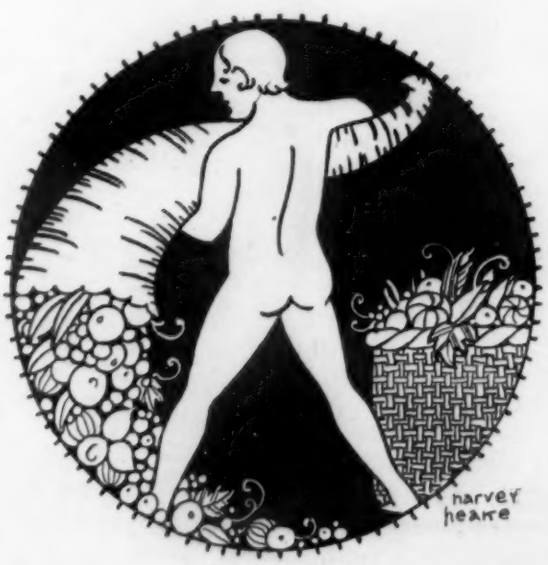
"Ach! you vere going out, Doctor?" the farmer asked in surprise, halting at the foot of the steps.

"Did you wish to see me?"

"If you vould! It's my wife—very sick. Ve vere going to her mutter's and vere caught in the storm."

He clumped up the steps to get out of the rain and partly uncovered his bundle, revealing a robust young woman. From her staring eyes and the groans escaping from her contracted lips, Sedge guessed her condition, but nevertheless for a few seconds he stood looking at her drawn, perspiring face, and then at the stupid face of the husband. Then he turned slowly and unlocked the door. As he picked up the satchel, he could hear the faint chinking of the instruments inside.

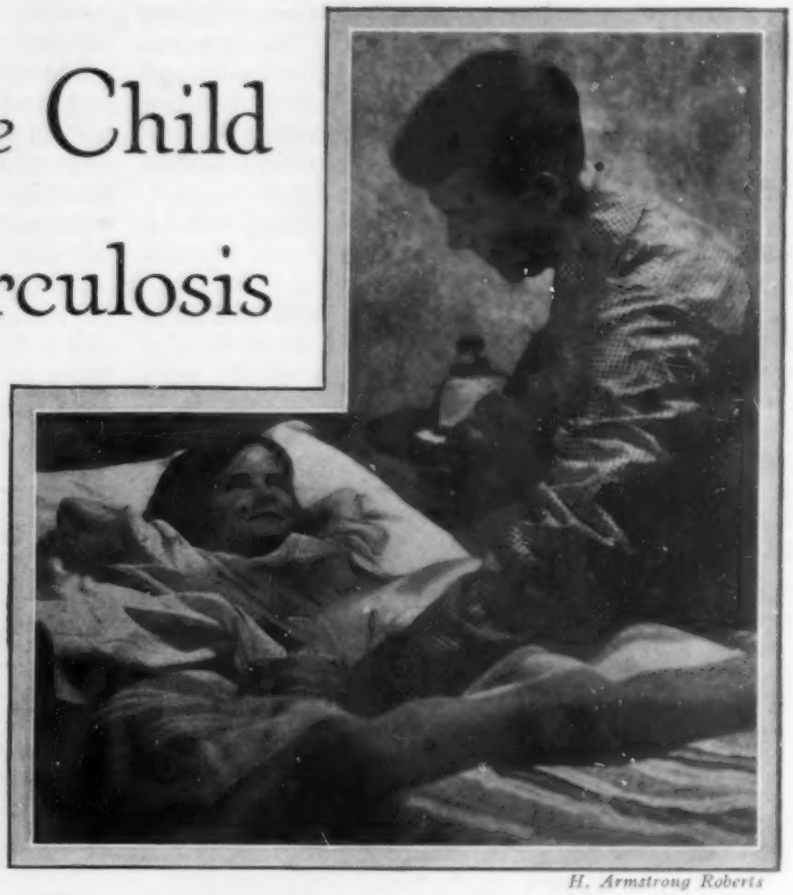
"Come in," he said gravely and led the way into the consulting room.



Protecting *the* Child *from* Tuberculosis

By

J. A. Myers



H. Armstrong Roberts

Father's bronchitis occasionally turns out to be tuberculosis, and little daughter becomes infected.

THE germ that causes tuberlosis is known as the tubercle bacillus. Until about 1882 man knew nothing about this germ. Since that time study has shown that there are three distinct types of tubercle bacilli. The human type, as the name indicates, is most commonly found in human beings, but it is capable of producing disease in lower animals. Nearly all tuberculosis of the lungs in adults is due to the human type. Therefore, children coming in contact with persons ill from pulmonary tuberculosis are likely to become infected with this type of germ. Next in importance is the bovine type of tubercle bacillus, most commonly found in cattle but also found in swine and other domestic animals. This type also produces disease in the bodies of human beings, particularly children, and therefore is a source of considerable danger to the child, as foods from cattle constitute such an important part of the child's food supply. The avian type of tubercle bacillus is most commonly found in the common or domestic fowl and the English sparrow. It has been said to produce disease in man occasionally, but recent evidence has not confirmed this belief.

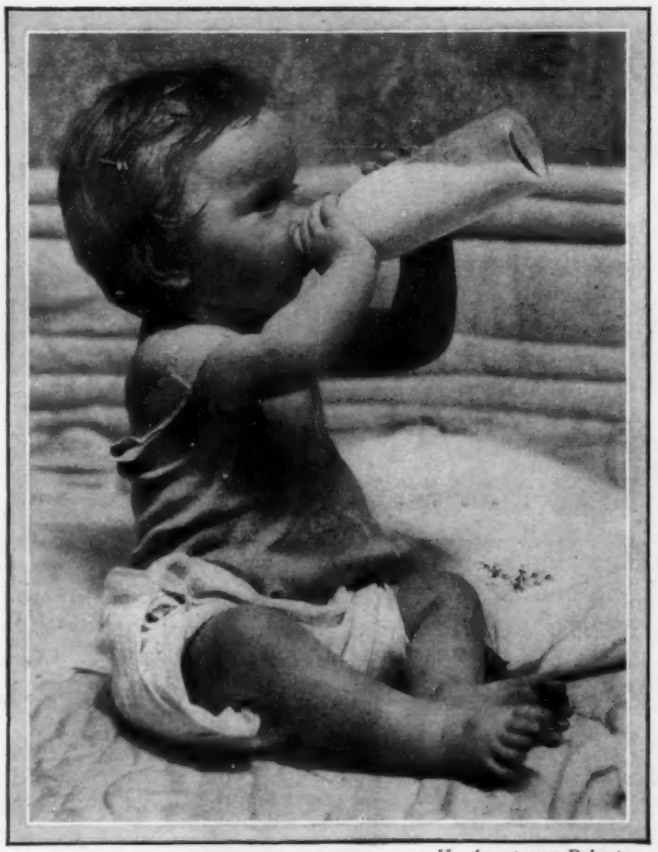
Although tubercle bacilli do not multiply in nature outside the bodies of human beings and certain animals, they are capable of living for long periods of time after being cast from the diseased person or animal. They may thus reach the bodies of children directly or indirectly from those suffering from tuberculosis.

During the first year of the infant's life the sources of exposure are not numerous. The infant usually has only a few associates, but they are very close ones. If one of them is suffering from tuberculosis, there is likely to be frequent transmission of the germs from patient to infant. The pernicious practice of fondling and kissing infants has undoubtedly resulted in large numbers of deaths not only from tuberculosis but from other diseases transmissible in this manner. Obviously, tuberculous patients with germs in their sputum through coughing, sneezing or mouth-to-mouth contact transmit huge numbers of germs to infants. Not all persons with tubercle bacilli in their sputum are themselves sick; some of them are tuberculosis carriers. Not infrequently such carriers are apparently in perfect health and have never lost their earning capacity. Many have been brought to light as carriers through the death of infants from tuberculosis. The following case is a good illustration of this point.

A baby boy was admitted to a hospital because he had become suddenly ill. He was suffering from tuberculous meningitis, which resulted in death. The physician who attended the tuberculous infant believed that some close associate was either suffering from tuberculosis or was a tuberculosis carrier. He advised first that the father and mother be examined. The father was apparently in excellent health, had never lost his working capacity and felt that the child could not have contracted disease from him. Nevertheless, the examination re-

vealed evidence of an unmistakable tuberculous process in one of his lungs. It had the appearance of disease of long standing, which perhaps had been present for years though it had never caused illness. When the sputum was examined, it was found to be teeming with tubercle bacilli. Although several years have passed, this man still has germs in his sputum, but he has an excellent working capacity and apparently is in perfect health.

Fatal cases of tuberculosis in infants and children often arouse suspicion and lead to the detection of active tuberculosis in adults who previously had not taken time to be examined or who were under the impression that they were suffering only from such a disease as bronchitis. Through the Lymanhurst School for Tuberculous Children in Minneapolis the finding of tuberculosis in children has frequently led to the detection of carriers and tuberculous persons among the children's associates such as the following:



H. Armstrong Roberts

Pasteurization, properly carried out, makes the baby's milk safe.

Judith, 8 years old, was admitted to Lymanhurst School in March, 1929, with a diagnosis of childhood tuberculosis. The x-ray showed moderate enlargement with some calcification and parenchymal infiltration about the hilum nodes, and the tuberculin test was positive. On obtaining the routine history from the mother, she said that there had been no tuberculosis known in the family and there was no exposure to tuberculosis, unless there was a hazard in her playing in Elliot Park where the tuberculous ex-service men were wont to go.

On Nov. 12, 1929, Judith returned to school following an absence due to a cold and the school physician made a diagnosis of possible pleuritis, and an x-ray taken on the same day showed definite evidence of fluid and thickening of the pleura over the entire lung. In referring the girl to the city hospital the possibilities of exposure were more carefully checked. The mother reported that she had recently had an examination of the chest and was found normal, but that the father who had been suffering from bronchitis for some time had been given a preliminary chest examination at the city hospital and told to report for x-ray and laboratory tests, but had not yet returned to have his examination completed. The parents were cooperative, and the father returned to complete his examination, which brought out the fact that he was suffering not from bronchitis but from advanced pulmonary tuberculosis.

As tuberculosis is commonly found in persons beyond the age of 50 or 60 years and as at this age it usually does not produce the same symptoms as in early life, not infrequently tuberculous disease in the infant may be traced to an undiagnosed grandparent, aunt or uncle. Or the nurse may be a tuberculosis carrier. Reports have been made to show that most of the infants in certain hospital nurseries have been found to be infected with tuberculosis. In some such instances careful examinations of all the associates of the infants have revealed one or more tuberculosis carriers among the nurses.

Obviously, not one of these persons—parent, grandparent or nurse—would knowingly infect an infant with tuberculosis. In fact, there is nothing in the world they would not do, no sacrifice they would not make, to protect the infant from fatal disease. But, unknowingly, and this all too often because of neglect of their own conditions, they transmit tubercle bacilli to the bodies of infants. This fact is one of the strongest of all arguments for the periodic health examination of apparently healthy persons as well as for those suffering from disease. I have no doubt that if such health examinations could be carried out on a large scale many infants would be saved from tuberculosis each year. No health examination is safe, however, that does not include tuberculin tests, x-ray and laboratory studies.

As the infants grow older there are other dangers of tubercle bacilli reaching their bodies. Promiscuous spitting is an extremely dangerous practice so far as the infant is concerned. The tuberculous patient or carrier may expectorate

on the sidewalk or on the ground large numbers of living, virulent germs. The soles of shoes come in contact with such sputum and may carry the tubercle bacilli into houses where they are deposited upon rugs and floors. Here infants play, particularly during the second year of life, their hands coming in contact with objects contaminated with tubercle bacilli and only a little later to their mouths. The house fly, which so frequently crawls about in sputum laden with tubercle bacilli, may a few minutes later be crawling about the food or even about the mouth of the sleeping infant. A mother, perhaps one suffering from tuberculosis, coughs and even expectorates into her handkerchief and a little later with the same handkerchief attempts to dry the eyes of her crying infant.

The foods of infants constitute a great source of danger unless they are properly inspected and carefully prepared. The infant's first food, the mother's milk, rarely contains the germs of this disease even if she is suffering from tuberculosis, unless the mammary glands have become tuberculous. Although the tuberculous mother usually does not give off tubercle bacilli through the breast milk, most certainly she should never be permitted to nurse her infant, since he comes in such intimate contact with her that there is great danger that the germs will reach the infant's body through coughing, sneezing, talking or contaminated hands. Obviously, if after the child begins to take other foods the one preparing them is a carrier of tubercle bacilli or is suffering from the disease, the food may become contaminated and through it the germs enter the infant's body.

In the past a tremendous amount of tuberculosis in infancy and childhood was caused by the bovine type of germ reaching the body of the child through contaminated milk. In most cities in which pasteurization ordinances are in effect the incidence of tuberculosis in childhood caused by the bovine type of germ has tremendously decreased. There is still, however, much tuberculosis in childhood caused by this type of germ because public health education has not been sufficient to convince or even to reach every one. The result is that many infants are still being fed cow's milk contaminated with tubercle bacilli. Those persons interested in the production and sale of goat's milk often present the argument that cows suffer from tuberculosis much more frequently than goats. This is true, but goats do suffer from tuberculosis. Every precaution, therefore, should be taken to prevent the germs from reaching the infant's body even when goat's milk is used.

At one time it seemed that certified milk would suffice for infants but even this has its dangers, and the cost of its production makes its selling price prohibitive to many families.

Pasteurization of milk, when the procedure is properly carried out and when milk is not later contaminated by tuberculous patients or tuberculosis carriers, makes it absolutely safe for the infant. Those who argue against pasteurization hold that the heating process destroys some food elements. This has not proved to be true except that there is slight destruction of vitamin C. But this vitamin is abundant in common foods, such as oranges and tomatoes, and certainly the slight destruction of vitamin C cannot be compared with the great danger to the child through living tubercle bacilli in the milk. Therefore, we should always insist upon the pasteurization of milk. Those who do not live in cities in which pasteurization ordinances exist may render milk safe for infants by bringing it to a boil and immediately cooling it. This, like pasteurization, is sufficient to kill the tubercle bacilli.

In cities in which pasteurization has been in effect the incidence of the bovine type of tubercle bacillus causing disease of the lymph nodes, bones and joints has greatly decreased. As the

Lynwood M. Chace

Goat's milk may be safer for the child than unpasteurized cow's milk, but goats sometimes have tuberculosis, although less frequently than cows.

bovine type of tubercle bacillus more frequently attacks the bodies of children than adults obviously pasteurization has done most to protect children from tuberculosis.

Not infrequently one finds dogs and cats in the home. The child, particularly after the age of 1 year, delights in petting these animals. Such pets sometimes suffer from tuberculosis and they frequently come in contact with the tubercle bacilli on the ground and on the street and no doubt carry them into homes. Therefore, the members of families who insist upon having such pets in the home should have them properly examined by a veterinarian and should control their whereabouts to make sure that their fur and feet do not become contaminated.

Protecting the Runabout Child

During the period of from 2 or 3 years to puberty the child's associates and surroundings change tremendously. In the early part of this period, children play on ground frequently contaminated with tubercle bacilli through promiscuous spitting. This is a source of danger to children since they frequently pick up soiled or infected objects from the ground and place them in their mouths.

During this period also the child's food changes. Foods are taken in a raw state more often than by the infant, and these raw foods may carry large numbers of tubercle bacilli to the bodies of children. Fruits and certain vegetables may become contaminated by a tuberculous patient or a tuberculosis carrier who has handled them.

The child's associates, of course, become more numerous as he grows older, plays upon the streets and enters school. Fortunately cases of tuberculosis of the lungs with tubercle bacilli in the sputum are not common in childhood, although they do occur; and, since this is true, there is tremendous danger from the undetected cases. In the examination of large numbers of school children one occasionally finds a child with extensive tuberculosis of the lungs and large numbers of tubercle bacilli in the sputum. Children may not complain of symptoms as early as adults and for that reason may remain for considerable periods of time among other children. Through coughing and sneezing tubercle bacilli may pass from their bodies to the bodies of healthy children. We have not educated children sufficiently regarding the prevention of disease, for we frequently see them swapping bites of apple and exchanging chewing gum and pencils. Objects that one minute are in the mouth of the definitely tuberculous child may be the next minute or even the same minute in the mouth of a healthy child.

Only a few of the outstanding possibilities of tubercle bacilli reaching the bodies of children have been discussed. There are many others, less obvious, but nevertheless dangerous.

Tubercle bacilli must gain entrance into the body before any harm can result. Certain portals of entry to the body are important. Contaminated food taken into the mouth carries tubercle bacilli to the digestive tract. When one considers the large numbers of possibilities of food becoming contaminated, it would seem that this is the most common portal of entry during infancy and childhood.

The air that the child breathes may also become contaminated through the coughing, sneezing or even talking of a tuberculous patient or the tuberculosis carrier. Particles of saliva are ejected from the mouth by these acts and may be carried for some distance in the air of rooms. In fact, the finer particles may float about in the slowly moving air currents of rooms over considerable periods of time. The particles that settle to the floor may soon dry, become pulverized and later be found in the dust contaminating the air. The same is true of sputum expectorated in places in which the sun does not come in direct contact with it. When air so contaminated is breathed, obviously tubercle bacilli are taken into the body by way of the respiratory tract. The respiratory tract is so constructed that a high percentage of all foreign material is deposited in the nose, throat, the trachea and bronchial tubes. A small percentage, however, of such foreign material does reach the lung tissues and thus the germs are carried directly to the lungs.

In addition to the possibilities of tubercle bacilli entering the body through the mucous membranes of the nose, mouth and throat, they may enter through the membranes of the eye. Here the danger is evident, when the eyes of infants and children are dried by handkerchiefs used by tuberculous mother or relatives. There is also danger from the rubbing of their eyes by children whose hands are contaminated.

Abrasions of Skin Permit Entry of Germs

Obviously, more tubercle bacilli come in contact with the skin of the hands and face and the feet, if the child is barefoot, than any other parts of the body. The skin is resistant when it is in a normal state, but slight abrasions may be sufficient to allow the germs to gain entrance to the body. Sputum teeming with tubercle bacilli may be applied to the normal skin of animals with practically no harm to them, but if a razor is passed over an area of the skin of an animal in the same manner as in shaving and if sputum-containing tubercle bacilli are then applied sufficient abrasions may have been produced to allow tubercle bacilli to enter.

There is no doubt that tubercle bacilli may reach the bodies of children from many different sources and that they may gain entrance, often to cause great destruction, through several portals of entry. These facts also apply to adults.

Sensible Dress for Nursery Folk

By Jesse R. Gerstley

IN ORDER to give advice to mothers on the subject of proper clothing of the child under school age, one must have knowledge of a variety of environmental factors, such as climate, season of the year, temperature of the home and the temperature and ventilation of the nursery school in case the child attends one. But the most important influence is the intelligence and common sense of the mother.

In the winter months the child must be dressed according to the temperature of the home. A good working rule is to have the house temperature 70 F. or a little less. With such heating the child is really in a moderate summer temperature. He should wear cotton underwear, shoes, stockings and a light weight suit. Then when he goes out into the cold, wraps can be piled on to meet the environment. But the mother must remember that the best index of how much to put on is the child's comfort. Enough clothing should be worn to insure comfort, but neither in winter nor in summer should the child be uncomfortably warm. That is the surest way to make him take cold.

While in summer at a temperature of 70 degrees or less, short socks are sufficient, in winter, at a room temperature of 70 degrees, high stockings are better. Although the room temperature may be comfortable, the cold air seeping in through the windows flows along the floor; so while the child is breathing summer air, his feet are in a colder temperature and should be protected.

In rural communities in which a temperature of 70 degrees cannot be maintained, wool underwear can be substituted for cotton.

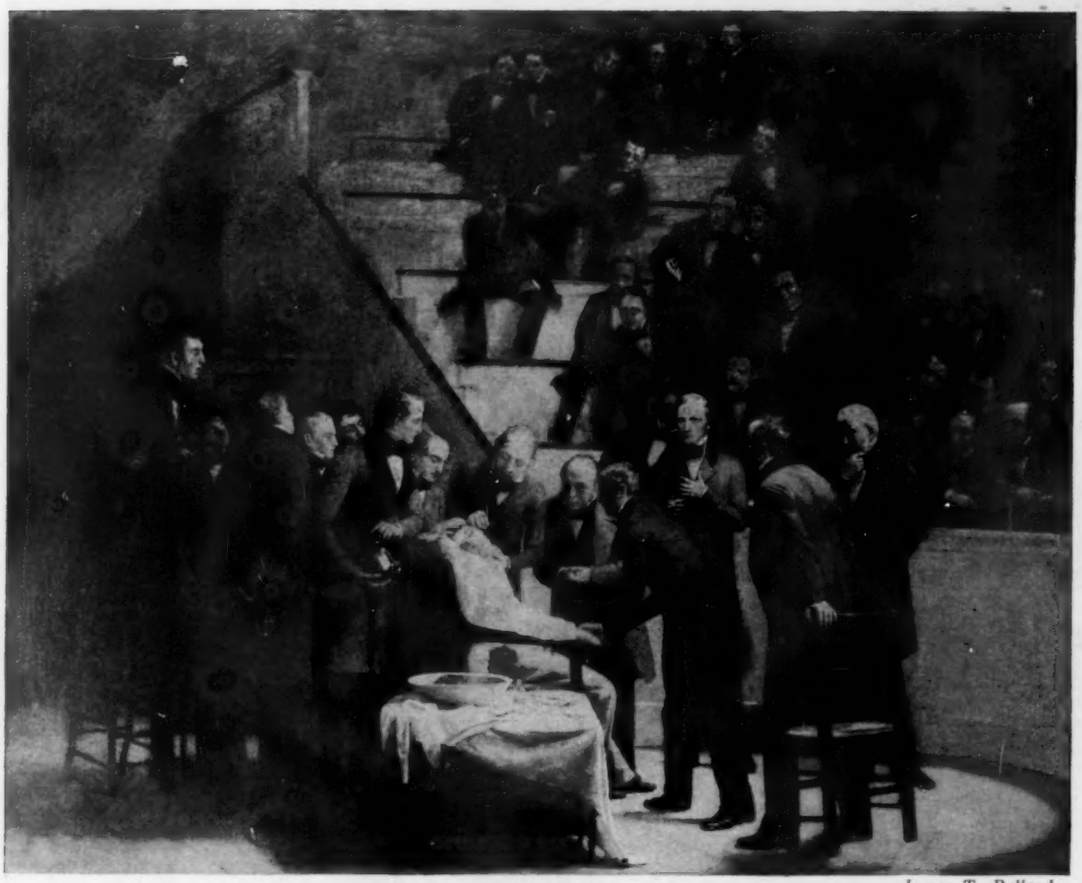
If the child goes to kindergarten, the problem may be more complicated. If the kindergarten is colder than the home, the child should be clothed in woolen underwear. As a rule kindergartens and schools suffer from the same ignorance in heating and ventilation as do our miserably overheated city apartments. Just because it is winter, the rooms are made as hot as a human being can endure them, often close to 90 degrees. To put a child with heavy winter clothing into such a temperature is the surest way to invite bronchitis and pneumonia when he goes outdoors. If the kindergarten suffers from overheating, the child should wear light summer clothing and rely on warm external wraps for wear to and from school.

It will be seen that there can be no hard and fast rules. Simple common sense is the essential. The child must be kept comfortable and must be dressed according to the temperature of his home or his school and not according to the outside cold. Too much clothing is just as great a mistake as too little and is perhaps even more likely to predispose to grip, bronchitis and pneumonia.

In the summer time with a temperature in the nineties, the less clothing the child has on the better. In this respect the sunsuits, which have recently come into vogue, are invaluable. They are thin cotton trunks with suspender straps over the shoulders. Originally designed for infants, they are now made in sizes large enough for the runabout child. As the temperature gets down to 80 F. or below, particularly if the day is windy or if the child is not playing in the sun, the sunsuit or light underwear should be covered with a play suit.

A light sweater can be added for a still lower temperature or it can be put on in the evening if the child seems to be cold.

As a general working rule, the runabout child should wear less clothing than an adult in the same temperature, for the child is always much more active.



James T. Ballard

Morton, "the upstart dentist," in 1846 made good his wild claim that he could make a patient insensible of pain.

The Story of Anesthesia

By John H. Evans

FOR thousands of years mankind had been searching for some means of abolishing the pain produced by surgical manipulations and operations. When it was finally discovered and made known to the world eighty-four years ago, science was so taken by surprise that she had no name by which to call this angel of mercy which was to drive the demon of pain from the surgeries of the world. In the dictionaries of science and medicine there was no word to designate the dreamless sleep of oblivion that was to replace the pangs of agony suffered by the patient during a surgical procedure.

At this time there lived in the city of Boston, where the sleep-producing property of ether was first made public, a great poet as well as a great physician by the name of Oliver Wendell Holmes. He suggested that the term "anesthesia" be applied to the condition of insensibility to pain and that the word "anesthetic" be used to designate the drug capable of producing it. And so it came about that the author of Old Ironsides coined for us these two important words, "anesthetic" and "anesthesia."

The word "analgesia" is of more recent origin and means insensibility to pain without loss of consciousness. This state exists when a local anesthetic is employed; that is, the patient is conscious but insensible to pain in the area affected by the local anesthetic. Analgesia may be produced by inhaling any of the general anesthetics, such as chloroform or nitrous oxide, in which the patient is almost asleep yet sufficiently awake to open or close the eyes when requested to do so and in some cases to carry on a conversation. When analgesia is induced by a general anesthetic the entire body is insensible to pain yet the patient is partly conscious.

This light form of anesthesia is not often used in general surgery, but it is almost universally employed in relieving the pains of labor during childbirth and by dentists in making sensitive fillings.

The twilight sleep, which was exploited by the newspapers a few years ago and which has fallen by the wayside as so many medical fads do, is an analgesia produced by the hypodermic injection of morphine and scopolamine.

It is difficult for those of us who have been born into a world in which surgical pain has been conquered to comprehend the conditions that existed before the advent of anesthesia.

The operating rooms were literally chambers of horror in which every moment of the operation seemed an eternity of agony for the patient although all the measures then known to science were employed to lessen the pain. These consisted in giving of such drugs as opium, cannabis indica and hyoscyamus, the inhalation of fumes from a concoction of soothing drugs, pressure on blood vessels and nerves, or an attempt at hypnotism. It was only on rare occasions that these measures proved effectual, and it became necessary for strong men forcibly to hold the patient on the operating table while the surgeon performed the operation as quickly as possible. The death rate was high and the end-result of the surgery done on those that did survive was often unsatisfactory because accuracy had to be sacrificed to speed.

Only the most urgent operations were advised and these were often refused because the patients preferred death rather than the pain of the operation. The surgical patients of those days had good reason to say, "I dread the operation."

Anesthesia has removed the terror from the surgeon's knife and major surgery has been made possible. Today the most prolonged or difficult operation can be performed without haste on the part of the surgeon and without pain on the part of the patient. This happy situation has been instrumental in saving many thousands of human lives each year.

For the discovery of anesthesia and the untold good it has done we are indebted chiefly to three men, one of whom was a physician, one a dentist and the other both a dentist and a physician.

Dr. Crawford W. Long was the first to discover that the pain of a surgical operation could be eliminated by the inhalation of ether. He was a graduate of the University of Pennsylvania and practiced medicine in the village of Athens, Ga. His first operation under ether was in 1842, the bill for which is still in existence and reads as follows:

For sulphuric ether.....	$ .25
For exsecting tumor.....	2.00
Total	$2.25

A patient receiving a bill today for similar services would be inclined to say, "Them were the good old days." As Dr. Long was a country practitioner and his surgical cases few and far between, he did not publish his results until seven years afterward when others had laid claim to the honor of discovering anesthesia.

In 1844, two years after Long's first use of ether, Horace Wells, a dentist of Hartford, Conn., discovered the anesthetic property of nitrous oxide, or laughing gas, and used it for the painless extraction of teeth. He was so successful that he ventured to give a public demonstration of its use in surgery, but his attempt proved a failure. He was so chagrined that he gradually lost his reason and four years later took his own life. Wells did not know, as

Fred L. Fales

A monument to Morton stands in the Boston Public Gardens, one of the numerous monuments erected to his memory.

we do now, that for the successful administration of nitrous oxide for prolonged surgical operations it is necessary to combine it with oxygen, that it must be given with an apparatus for measuring the percentages of each gas accurately, and that considerable experience or thorough training in its use are essential requirements.

It was not combined with oxygen until twenty-four years afterward and it was several years after that before a suitable apparatus was invented. Not until recent years have anesthetists been willing to devote sufficient time to learn the peculiarities of its behavior as an anesthetic and the technic of its administration and to acquire the experience necessary to make its use practical in the major operations.

Ewing Galloway

An important member of the modern operating team is the anesthetist.

We are indebted to Wells for the pleasantest anesthetic that we know today. It is popular with the patient because its odor is not disagreeable, consciousness is lost quickly and quickly regained after even the most prolonged operation, and its after-effects, such as nausea and vomiting, are less than with any of the other anesthetics. It is a pity that Wells could not have known what his discovery was to mean to the human race.

Two years after Wells began using nitrous oxide for the extraction of teeth, and while Long, down in Dixie Land, was administering ether to his occasional surgical patient, a graduate dentist by the name of William T. G. Morton, who was at that time a sophomore medical student at Harvard University, discovered, independently, the anesthetic property of ether. On October 16, 1846, he gave a successful demonstration of ether anesthesia before his professors and classmates, the operation, which was the removal of a large tumor of the neck, being performed by Dr. John Warren. Other operations under ether quickly followed, the results were published and within a year ether was used in all the large hospitals of the world. October 16 is celebrated each year in Boston as Ether Day.

Morton was elected to the Hall of Fame several years ago but it was only in 1926 that the statue of Long was placed in the Congressional Hall of Fame in Washington, the ceremony being attended by two of Dr. Long's daughters and a delegation from the International Anesthesia Research Society and the Associated Anesthetists of the United States and Canada.

Since the introduction of ether and nitrous oxide there have been several other inhalation anesthetics discovered; only three of these are in common use; namely, chloroform, ethyl chloride and ethylene, the latter having been discovered only seven years ago.

The first local anesthesia, that of cocaine, was discovered in Germany by Dr. Koller in 1884, thirty-eight years after the introduction of ether anesthesia. There is now a long list of local anesthetics, the two most commonly employed being novocain and urea quinine hydro-

chloride, which are much less poisonous than cocaine.

There are three methods of employing a local anesthetic: (1) by infiltration, when the anesthetic solution is injected directly into the tissues to be operated on; (2) by injecting it into or near a nerve at its source so that the area supplied by that nerve will be insensible to pain, which method is described as conductive, regional or block analgesia; (3) by injecting it into the spinal canal so that the lower half or more of the body will be anesthetized, producing spinal analgesia.

The word anesthesia, however, is commonly used instead of analgesia in all of these subdivisions of local anesthesia.

Local Anesthesia

Ethyl chloride is both a general and a local anesthetic. Its local effect is produced when it is sprayed on the skin, as freezing takes place owing to its rapid evaporation. It is used for skin incisions such as that of opening boils or for incising an abscess of the gums, but it is not popular for the reason that the thawing out of the frozen part is often accompanied by pain.

Now that there are several methods of eliminating the pain of a surgical operation, the questions that confront the patient are which anesthetic to choose and whom to select for its administration.

While the anesthetic agent and the method to be employed in its administration are largely matters for the surgeon and the anesthetist to decide, the tendency is for the patient to exercise increasing discrimination in the choice of both surgeon and anesthetist. The life of the patient during the operation is directly in the hands of the anesthetist, and the public is gradually being educated to the importance of the services which he is capable of rendering not only in the preservation of life upon the operating table but in lessening the postoperative mortality rate and in making the convalescent period pleasanter and shorter.

For many years after the introduction of anesthesia the question of who was to administer the anesthetic was considered of little importance, it being left for the most recent and usually the least qualified intern in the hospital, or to the clinic orderly or to any chance bystander who was not particularly engaged at the moment. As a result the surgeon was obliged to endeavor to do two things at one time; namely, to operate and to superintend the anesthetic. He was often interrupted in his work by the necessity of doing artificial respiration on the overdosed patient. The result was a large number of deaths on the operating table as well as after the operation as a result of the inability of the patient to overcome the poisonous dose of the anesthetic. The asbestos curtains were not put in the theaters after the first outbreak of fire, neither was it deemed necessary for any one especially to qualify himself to administer anesthetics after the first death, or even after several hundreds of deaths.

In the early days and even up to twenty years ago, the giving of the anesthetics was considered unworthy of special attention, it being beneath the dignity of a physician to think of making it a specialty. The same was true in regard to surgery and obstetrics in the early days of their development. For hundreds of years the surgical cases were treated by the barber, that being the reason the streak of red was put in the barber's sign. In obstetrics, the midwife was supreme, and even in these days, especially among the foreign element of our population, the midwife is employed.

As the administration of an anesthetic gradually became more respectable, the young physician, while waiting for a practice, often condescended to give a few anesthetics to help pay the overhead. To him it was simply a means to an end. It has only been during the last twenty years that physicians have deemed the scientific administration of anesthetics an end in itself. The original aim of these pioneers in anesthesia was to lessen the number of deaths that occurred on the operating table by a special study of the anesthetic agents to determine their various degrees of toxicity and to attempt to improve the methods of their administration by particular attention to dosage and to the signs indicative of danger.

Anesthetists Help Keep Down Death Rate

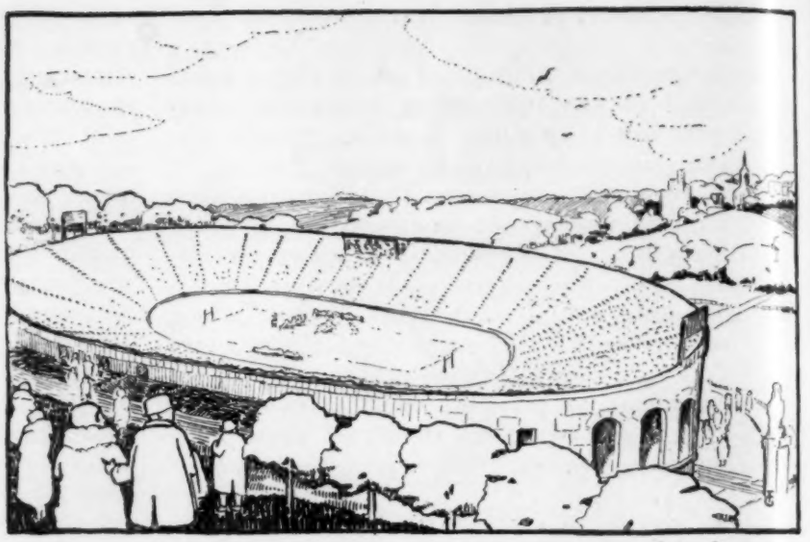
In this they succeeded beyond their fondest hopes, but it was soon apparent that the qualified and experienced anesthetist could also be instrumental in reducing the postoperative death rate. This he accomplishes by a careful study of the poor risk patient before operation, consulting with the surgeon as to the best anesthetic and method to be employed, by the careful watching of the patient's condition during operation by the frequent taking of the blood pressure, pulse and respiratory rates and by suggesting the appropriate treatment to ward off approaching shock. He is the only member of the operating team who is in position to make these important observations and when the surgeon has confidence in the anesthetist's ability, he will be willing to be governed by his judgment as to how much surgery the patient is able to withstand and will either hasten the completion of the operation or postpone it when advised to do so by the anesthetist.

This team work between surgeon and anesthetist results in a higher percentage of recoveries by the conservation of the patient's recuperative powers, and the old time comment that the operation was successful but the patient died is less frequently heard.

(To be concluded in December.)

Physical Illiteracy

By James Edward Rogers



The ones who need exercise most sit at games and cheer those who need it least.

THE trouble with present-day Americans is that they are affected with the disease of "sititis." They sit at the radio, the theater and the automobile wheel, and the very ones who need exercise most sit at games and cheer those who need it least. America has become a nation of spectators, who pay big money for the development of physical giants. Adult America is dying between the neck and the waist line from diseases that come not from without but from within and attack the four vital organs—the heart, the lungs, the kidneys and the liver. Physical degeneracy is becoming an increasingly important problem.

For this reason it is vitally necessary that physical education be taught in the schools. One educator even went so far as to suggest that physical tests be made a prerequisite of graduation in schools. But the average educator still thinks that education is composed of training in the three R's. Physical education does not mean the development of acrobats or the swinging of dumbbells, nor does it mean the development of great physical strength. It means rather that the youth of the land be taught again the sanity of the old expression, "A sound mind in a sound body."

Our public schools are responsible for physical illiteracy as well as mental illiteracy. The requirement for graduation from our high schools should be a sound mind in a sound body. About 70 per cent of our twenty-five million school children between the ages of 5 and 20 have physical defects. Of these defects 60 per cent are easily remediable. They pertain to height and weight, eyes, nose, throat, ears and teeth. If neglected they do two things: first, they mar the health and physical fitness of the child as he grows into adult age, and, second, they retard him in his progress through school.

The correlation between a pair of glasses and reading is high. Johnny who fails to hear his teacher fails in his arithmetic because he is one of the 9 per cent who is hard of hearing. Correction of physical defects will help the teaching of the three R's. The neglect of such defects as bad tonsils, adenoids and decayed teeth, which are easily remediable, often causes absence and retardation.

If the ages between 45 and 65 are now the dangerous ages in the diseases of the vital organs, the cause can often be traced to neglect in the correction of the simple defects found in school children. Therefore the correction of defects during the school ages is not only a great saving of school finances but it represents a great saving in the cost of community health.

The three great extra costs to education that amount to thousands of dollars in communities and states every year are absence, retardation and the lack of acceleration in promotion. In one state the average pupil was absent eleven days during the year and seven of these absences were due to common colds, which could be more or less controlled under a school health program. Neglected sore throats often lead not only to long absence but to nervousness, forcing girls and boys to repeat their grades, which is not only costly to the child but expensive to the taxpayer.

It costs about $100 a year to educate a child, and if he has to repeat the grade this expense has to be doubled. Multiplying the number of children in each state that repeat one of the twelve grades, the annual cost because of this neglect is tremendous. The taxpayer is paying

a bill that could be materially reduced if the school had a health and physical education program.

The schools of the country are doing much to take care of the physical welfare of the children. Some twenty states have a state director of health and physical education on the staff of the state superintendent of schools. These physical education bureaus in the state departments of education are promoting some splendid statewide school health programs. A few of the states doing especially fine work are Pennsylvania, New Jersey, Connecticut, Virginia, Florida and New York.

The five point system of Virginia is famous throughout the country for getting school children to correct their defects. A five point child is one who has no defects or has corrected himself in the five points of weight-height, eyes, nose, ears and throat. A certificate signed by the state superintendent of schools and state commissioner of public health, with the gold seal of the state stamped on it, is presented to every five point child. Some cities and counties boast of having 100 per cent records with every child free from any one of the five outstanding defects.

In Virginia the classroom teacher in all rural schools is trained in health education. Every classroom teacher is a trained health educator. She knows how to make a daily morning health inspection and how to detect common ailments. In all schools in Virginia each morning after "America" is sung and the flag saluted, there is a five-minute health inspection. Through the cooperation of the state board of education and the state board of health, with the school and health agencies, more than 80 per cent of the total school population is given annual physical and health examinations. In many counties and states some 70 per cent of all school children have one or two defects corrected in the year.

Parents and children covet these five point certificates, which are distributed at graduation or at the county celebration of health day. The health day celebrations are great occasions. I recently visited an isolated county seat during a celebration. There was a parade with a band, autos containing the mayor and members of the board of education, and health floats decorated by the different schools in the county. Back of every float the five point children marched, the girls with a star band around their heads and the boys with a star band around their left arms. The children ranged all the way from the little ones in the first grade to high school children. They marched proudly with their heads high and their banners flying.

The National Congress of Parents and Teachers in the promotion of its summer round-up is making a nation-wide contribution to the correction of the common defects that assail children. The movement for the summer round-up is growing rapidly everywhere. This effort to have all our school children free from defects before they enter their first grade is conducive to the building of national physical efficiency. In several states, counties and cities, attempts are being made to have every school child before he enters the first grade have a complete health examination. It is felt that it is the birthright of every child to be physically prepared at the start of his school life. "A sound mind in a sound body" should be the slogan for every school.

Virginia leads the health parade with its "five point" children.

Mineral Springs of South Africa

SOUTH AFRICA is slowly but surely becoming one of the world's holiday playgrounds. But there is another aspect of the country that, though less widely known, is nevertheless equally deserving of the attention of overseas visitors. Here and there throughout the land, warm springs which have been found beneficial to health bubble up from the bowels of the earth. The main types of springs are radioactive, thermal, sulphur and chalybeate, and most of the best known springs possess more than one of these properties. The thermal is usually also alkaline—that is, it is a warm solution of the salts of metals—but there are a few unwarmed waters that are nevertheless alkaline, such as one of the seven springs at Caledon.

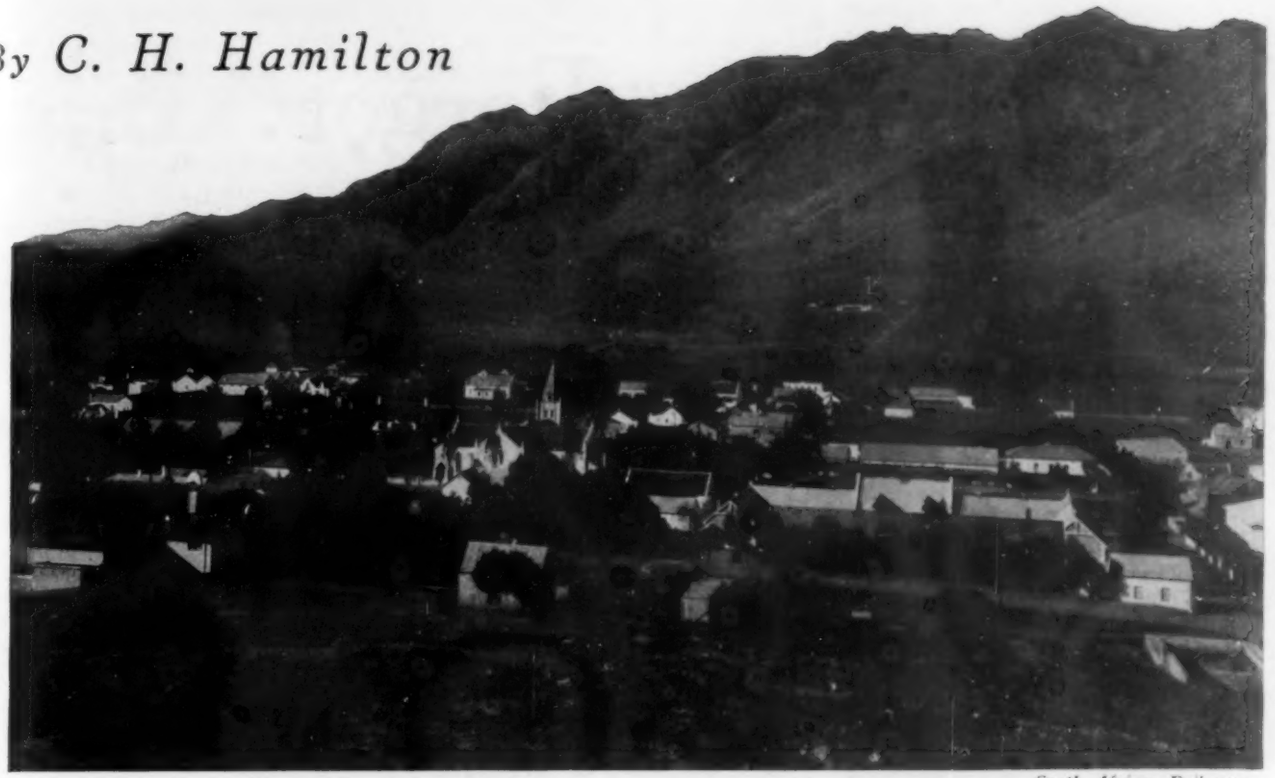
The South African climate adds to the benefits of these baths by almost uninterrupted sunlight. Moreover, the disadvantage of being a great distance from Europe and America is not as real as it appears at first sight, for the majority of those who come for the baths are business and professional men who have overtaxed body and digestion during the earlier course of a busy life, and to these men the rest attendant on the long voyage out to the South Africa baths is of inestimable benefit.

Caledon is the most popular bath resort in the country. The Caledon district generally, and especially the site of the springs, offers some of the most beautiful natural scenery in the Union. Its flora is known to botanists all over the world. The baths lie between the picturesque slopes of the Hartebeest and Zwaartberg mountains, 15 miles from the sea, at an altitude of 750 feet. The springs, which are seven in number, consist of highly concentrated solutions of iron salts. Six of these are warm, having the abnormally high temperature of 120 F. Few places could

South African Railways

Warmbaths is the Saratoga of South Africa. It is near Johannesburg, Transvaal.

By C. H. Hamilton



South African Railways

A general view of Montagu. The waters of Montagu Baths emerge from a rocky cleft at a temperature of 112 F.

offer either the sick or the healthy visitor a more pleasant holiday.

Historically the Caledon Baths were the first springs to be recorded in South Africa, and were in turn patronized by aboriginals, Dutch East India Company officials, and, after the British occupation, by naval and other British officials.

The Approach Through Cogman's Kloof

Montagu Baths are formidable rivals of those of Caledon. During the time that the visitor journeys through the celebrated Cogman's Kloof, he becomes aware that he is in a volcanic region. Above him tower huge spurs of rock, contorted and twisted as though by giant hands, and below the tortuous course-markings of confluent rivers prove that here at least the earth attempted to pierce its crust. But there is nothing fearsome to mark that long-past struggle, for river bank and mountain slope are covered with rich vegetation, and pleasant indeed is the picture of the Montagu Baths nestling where a mountain stream emerges from its wooded valley bed.

The waters of Montagu have a temperature of 112 F. on emergence from a rocky cleft. Here also is an equally enjoyable holiday spot for both the invalid and the visitor in perfect health. A warmed swimming bath in a natural bed of rock, mountains offering climbs of every description, caves where Bushmen's inscriptions give illustrative gleams of history, tennis, golf, rambles and drives through magnificent surroundings rich in beauty—these are only a few of the attractions that make Montagu a goal of holiday makers from many lands, in quest of pleasure and health.

Warmbaths, in the Transvaal, has long been so well known that its owners, the Potgieter family, felt it their duty to bequeath their gift to the nation. Consequently these warmed waters, of strong iron content, are in the ownership of the government under the stipulation that their use shall be free to all "without money and without price." The water emerges at a temperature of 140 F., and it is owing to the popularity of the baths, as much as the healthful climate of the locality, that a large number of people throughout the Transvaal, and especially from Johannesburg, frequent the resort in winter. The free camping sites are covered with tents of visitors during the course of the popular winter season.

And, Lastly, Aliwal North

The sulphur waters of Aliwal North are situated in a district hard to equal anywhere for the healthfulness of the climate. Besides the warm spring Aliwal North boasts a swimming bath and recreation grounds equipped with facilities for tennis, golf and bowls. The Orange and Kraai Rivers offer opportunity for fishing and boating. The surrounding country, which is hilly, gives ample inducement for rambles, picnics and bird shooting.

Tony Did Not Forget

By A. F. Tyler

"Da surgeon maka da operatzion free."

THE members of the Rozzaro household were talking loudly, emphasizing their words by much gesticulation and shrugging of shoulders. The surgeon had just examined Tony and had told the family he had a cancer. The word sank deep into their hearts, cutting like a stiletto. Could it be possible the surgeon was mistaken? Yet, Aunt Mary told them this surgeon was the best in town. She had known many persons whose lives he had saved and she was sure he would save Tony some way. The visiting nurse also had reassured them of the ability of the surgeon.

Only One Blemish on Tony's Body

Tony was a round faced Italian boy of 5 years, with dark, smooth skin, twinkling brown eyes and perfect white teeth. He was stocky with rugged, sturdy little legs. There was but one blemish on his whole body. Recently, his parents had noticed a round, smooth swelling the size of an orange in the right armpit. The skin was not broken nor was it discolored. Tony did not complain of pain. Although poultices had been applied, the swelling kept getting larger until now Tony could no longer get his right arm down close to his body.

In despair the family had turned to Aunt Mary, an older Italian woman who had lived in America long enough to learn the language. She was not only capable of interpreting for her people but had a heart that felt every emotion of the unfortunate with whom she came in contact.

Aunt Mary Recommends the Hospital

"But da surgeon say he puta 'im in da free bed at da 'ospital," said Aunt Mary as they puzzled over the expense, "and maka da operatzion free too."

Finally persuaded, the Rozzaros next morning arose earlier than usual, hurried through breakfast and, talking excitedly, ran to the street car which was to take them to the hospital. They reached there just in time to walk down the corridor beside the cart upon which Tony was being wheeled to the operating room. They could see the nurses going in and out and once caught a glimpse of the surgeon clad in a white gown, his face and hair covered with a white mask so that only his eyes were visible. They heard Tony utter a few muffled cries and tried to rush into the room where he was being put to sleep, but were restrained by an attendant. In a moment the cart, pushed by the nurses, carried him into the operating room. All was quiet except the weeping relatives in the adjoining room.

In a few minutes out came the cart and Tony was wheeled quickly to his ward and put to bed. A nurse sat quietly at the bedside. She wiped his brow, counted his pulse and talked soothingly to him when he stirred.

Tony had scarcely awakened from the anesthetic when the surgeon himself stepped into the room. Speaking quietly to Aunt Mary, he told her that the cancer under Tony's arm had grown fast to the big arteries so that it could not be removed. He was compelled to close the wound without taking it out. He thought the x-rays might help, so he would have the x-ray doctor treat Tony. While Aunt Mary told the parents what the surgeon had said, he slipped out of the room and was gone. The relatives sobbed and moaned and soon all their friends joined them until the nurse had to put them out of the ward into the corridor. The mother screamed and tore her hair. The father, beating upon his breast, knelt and prayed.

"Tony buya da duck to giva da doc."

The next day Tony was taken to the x-ray treatment room, where he lay quietly on the table while the machine was adjusted, for the doctor had explained to him how it would perhaps make him well again. There would be no pain to the treatment but only a light would shine on the sore spot under his arm. Mother could sit with him all the time and if he was a good boy the doctor would show him how he could see right through his hand with the x-ray.

On Thanksgiving eve some months later, the x-ray doctor and his wife were laying plans for the family dinner, which was to be held at their house next day, when suddenly the door bell rang. As the wife opened the door she stepped quickly back while a rough looking man dressed in working clothes and a boy in overalls pushed their way in. The man, speaking in Italian to the boy, shoved him forward and the doctor realized it was Tony and his father. In his hands, Tony held a market basket in which was a live duck. He thrust the basket into the doctor's hands.

The father brokenly explained, "Tony sella da pap. Soma time da snow cuta 'is face and freeza da nose but Tony sella da pap. Soma time da biga boys kicka 'im off da corner but Tony come back and sella da pap. Tony go to da school all day, sella da pap in da evening. He salla da pap till I coma from da work and taka 'im home. Some time he maka 5 cent, soma time he maka 10 cent but he never quit. He bringa da mon home. He sava da penny, buya da duck to giva da doc. He neva forget, he neva forget how da doc sava 'is life."

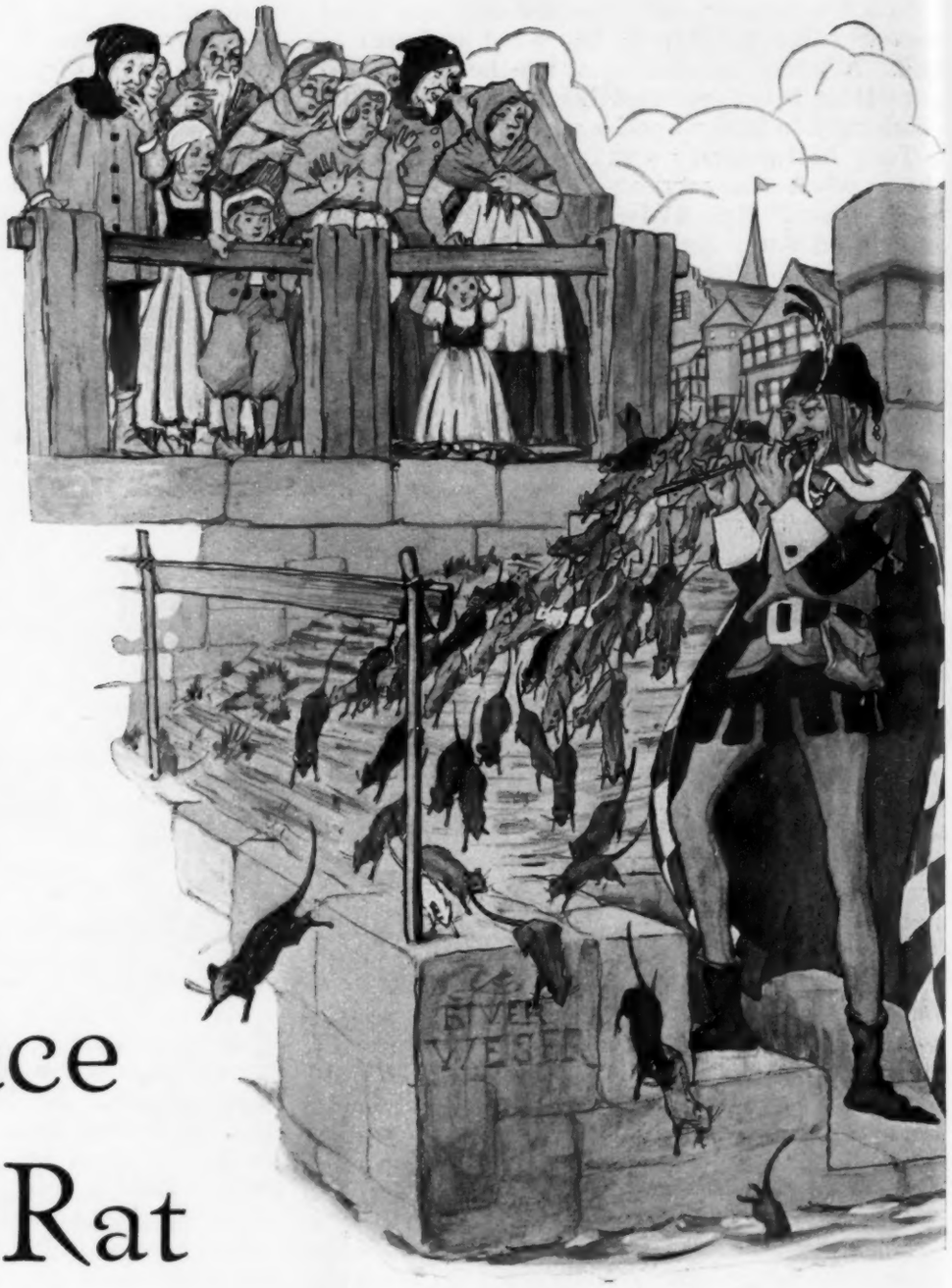
For Little Boys

God bless all little tousle-headed boys,
All Bold Explorers under Grown-Up skies,
All knobby knuckled devotees of noise,
All Robin Hoods and Arthurs in disguise.

God bless all little boys with sunburned knees,
Sworn enemies of garden plots and roses,
Who flaunt defiant cow-licks in the breeze
And wear large freckles spread across their noses!

—SARA HENDERSON HAY.

A Problem That Is Never Settled



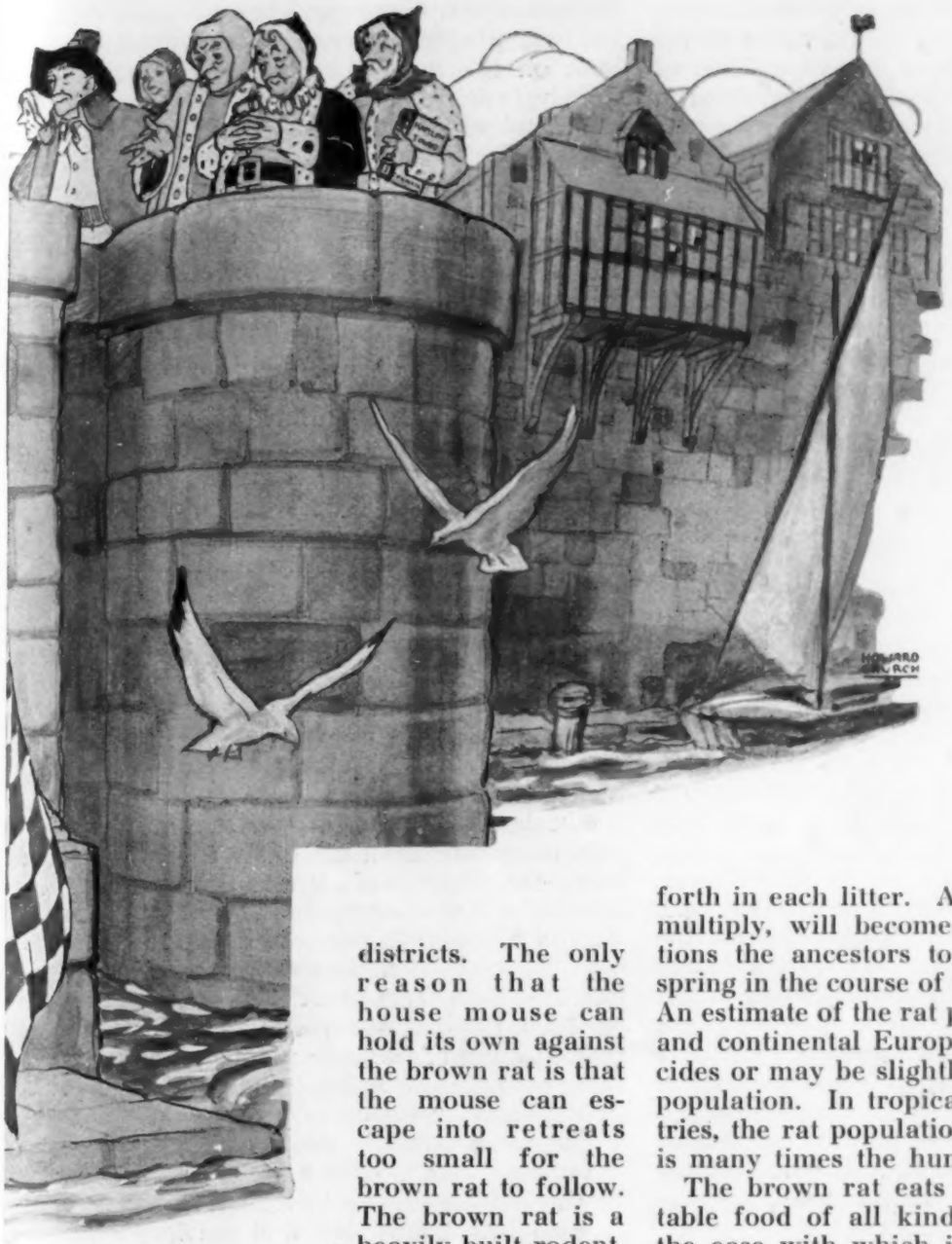
The Menace of the Rat

THE extent of the depredations of the common rat is not generally realized. Rats are one of man's chief rivals for the possession of the earth. They levy a ruinous toll on agriculture, commerce and industry. Great as is the economic loss, the rat is first and foremost a danger to public health. In view of this menace to the human family we should acquaint ourselves with remedies against it.

Rats are cosmopolitan. At one time the genus was found in a comparatively small part of the old world but now, largely through the agency of modern rapid transportation, it is present in all parts of the globe. Its fecundity, cunningness and adaptability to almost every kind of environment have enabled it to flourish and secure a foothold almost everywhere.

Of some 300 species found the world over, one known scientifically as *Mus norvegicus* is the most important in this country. Popularly he has many aliases, being variously known as the common, house, wharf, barn, gray, brown or Norway rat. This rat is larger, stronger, more robust, more ferocious, more prolific and differs in habits from the other species.

The *Mus norvegicus* is a burrower, living in excavations which it makes under buildings and in soil along river banks, in stables, feed shops, warehouses, markets, sewers and on farms. It quickly displaces all other species and is therefore found most commonly in thickly populated



By Louis Gershenfeld

districts. The only reason that the house mouse can hold its own against the brown rat is that the mouse can escape into retreats too small for the brown rat to follow. The brown rat is a heavily built rodent, approximately 18 inches in length, possessing a thick head and a tail always shorter than the head and body, short rounded ears and a dull brown color.

Rats are chiefly nocturnal; therefore, exact information concerning their habits may not be so detailed as one would expect to find when considering the life history of a rodent so commonly observed. Rats seem to have defective vision by daylight. Their sense of touch and smell is, however, extremely delicate. Rats depend more on their noses and ears than on their eyesight for obtaining their food and avoiding their enemies. They are very cunning, are quick to gather experience and learn to avoid dangers.

Climatic conditions and the food supply affect markedly the number of litters produced annually and the number of young brought forth in each litter. A couple of rats, if left to multiply, will become under favorable conditions the ancestors to many hundreds of offspring in the course of from eight to ten months. An estimate of the rat population in this country and continental Europe is that it at least coincides or may be slightly larger than the human population. In tropical and semitropical countries, the rat population is incredibly large and is many times the human census.

The brown rat eats animal as well as vegetable food of all kinds, and this accounts for the ease with which it adapts itself to almost any environment. Eight or ten adult rats can consume about a pound of grain in addition to damaging or rendering unfit for use an equal amount or many times this quantity. Can you then appreciate the enormous bill which we pay just for feeding this pest without even considering the cost of the material they attack and spoil?

It is impossible to obtain or even estimate approximately the damage caused by these rodents. Attempts have been made to collect such statistics. England estimates that the damage done in Great Britain and Ireland is approximately 75 million dollars annually; Germany claims an annual loss of 50 millions and France a loss of 40 million dollars annually. The loss in this country is estimated at a minimum of one-half billion and probably reaches closer to a billion dollars a year. Rats are our competitors for the world's food supply.

The rat cultivates and spreads disease-producing organisms and it is actually one of the greatest traveling agents of the organisms of death. Who can tell what the rat has done to the human race throughout the ages in the part played by this mammal merely in the dissemination of bubonic plague (black death) without considering other diseases that it spreads?

As it is now possible to hope that mankind may, to a great degree, be freed from certain age-long terrors and in particular the dreaded plague, it is to be remembered that unless we are prepared at all times to control the influx of rats, a great epidemic of this pestilence may appear and wipe us out.

Great epidemics of the black death have been recorded throughout history and it has raged in every country. During the fourteenth century it came nearer to the extirpation of mankind than any other pestilence or evil. This pandemic started in central Asia or southern Russia and, by way of Crimea and a Genoese ship, western Europe was reached.

It passed through Armenia to Asia Minor, Egypt and North Africa and finally the plague arose in England in 1348. Two thirds of the student body at Oxford and between one fourth and one half of the whole population perished. It was estimated that 25 million was the death toll in Europe and 13 million perished in China when the pestilence spread eastward, while other estimates are that one fourth of the population of the earth, or more than 60 millions of human beings, were wiped out. The Decameron of Boccaccio gives one of the most graphic accounts of this pandemic.

Epidemics of Modern Times

In modern times bubonic plague has raged in oriental countries, causing for many years in India an average of nearly one million deaths annually. In China epidemics have been almost constant until recently. It was during the Hongkong epidemic in 1894 that the causative agent of the disease, the *Bacillus* or *Pasteurella pestis,* was isolated. This serious epidemic starting in China, spread through Bombay to other parts of India, then to Madagascar into the Malay and Philippine Islands and other islands of the Pacific, thence through North America, South America, Europe and, in 1900, it appeared in Cape Town and on the British Isles. At least seven million British subjects succumbed within seven years.

In our own country during the early part of this century the disease was prevalent in San Francisco and for several years human cases of bubonic plague appeared. The disease never took on the menace of an epidemic due primarily to the energetic efforts of experts from the Marine Hospital Service (now the U. S. Public Health Service), who even though the local authorities were not in complete agreement with the federal workers for both political and economic reasons instituted thorough methods of rat extermination, rat-proofing and other necessary sanitary measures. We have here a practical example of a city being made rat-proof, so that in this instance the sacrifice of human life to the plague was limited to less than 200. More recently foci have appeared in Texas and New Orleans.

The causal relation between the large number of dead rats and the appearance of plague was observed at an early period in history, but it was only within recent years that the observation was made that plague is a bacterial disease of rodents and especially rats, which is commonly transmitted to man by fleas. The fleas, themselves infected, leave the dying rat, infest man and through their bite inoculate him with the causative agent of plague.

Discover Deadly Plague Bacillus

The latter, the *Bacillus* or *Pasteurella pestis,* was described simultaneously in 1894 by Kitasato, the famous Japanese investigator, and Yersin, a Frenchman, both working independently. Kitasato's paper preceded Yersin's by about three weeks. In 1898 Ogata found plague bacilli in fleas from rats dead of bubonic plague. In 1898 Simond carried out successfully the transmission of bubonic plague by the rat flea, these experiments being confirmed by Verjbitski in 1903 and by Liston in 1904.

The rat-flea-human method of the spread of the disease was most conclusively demonstrated by the British Plague Commission in India. It is with this knowledge that we know how to abate an epidemic of plague. The essential feature in any program of prevention is the keeping out of infected rats, for to attempt to stop plague by treating the sick would even with our methods of immunization be an almost impossible task in the wake of billions of infected rats allowed to multiply and carry on the deadly cycle unmolested.

Other rodents, even marmots and the Siberian tarbagan, but particularly squirrels, are frequently important factors in the perpetuation of plague and its subsequent transmission to the human family, but the rat on account of its greater numbers, its ubiquity and its more extensive traveling power is the most potent factor. The important problem in the prevention of this disease is the extermination of plague-infected rats, ground squirrels and other rodents and the destruction of and protection against fleas.

Besides bubonic plague, rats are responsible for trichinosis, a disease caused by an animal parasite called *Trichinella spiralis* or the trichinia worm. This is a slender, tapering worm about ⅛ inch long and is found in a large number of animals, but in this country hogs, rats and man are most susceptible.

Rats Carry Parasites of Trichinosis

Man usually becomes infected from eating raw pork contaminated with large numbers of the worms. Hogs become infected by the ingestion of trichinous meat of an animal, either as waste scraps of pork, carcasses of other hogs, or by devouring food contaminated with infected rat excreta or, what is the chief source of danger, by eating the dead bodies of infected rats and mice.

Rats are usually extensively infected in localities in which an epidemic of trichiniasis prevails. Around slaughterhouses and stables in which hogs are found, of all rats captured, 75 per cent and even as high as 100 per cent of these pests will be found trichinized as a result of their eating trichinous meat or food contaminated with infected dejecta. In countries such as Germany and probably Italy where pork is eaten raw, the first step taken to break up an epidemic of trichiniasis is by starting a campaign to destroy the rat, thus breaking the important connecting link in the chain which makes an epidemic of this disease possible.

Rats have been shown to serve as a reservoir for the spirochetes causing infectious or epidemic jaundice, also known as Weil's disease. The disease is transmitted to man, spirochetes gaining entrance through abrasions of the skin or by mouth from contaminated material. Rat-bite fever, a peculiar disease found in many parts of the world and especially in Japan, is caused by the bites of rats. This, a specific infection and caused by a spirochete, is not to be confused with other secondary infections that may set in after bites by rats occur.

Evidence is also accumulating to show that animal and vegetable parasites commonly observed in man are also capable of living in mice and rats. The rat absorbs and becomes the host of almost all kinds of organisms in its wanderings in garbage, dirt, filth and later on food-stuffs to be consumed by man and animal. It is possible to find all types of bacteria and even animal parasites on or in the body of the rat. It may be that in the near future it will be found that the rat is the direct or indirect cause of many of the disease conditions in man, the source of which has not as yet been clearly established.

Even though man has waged ruthless warfare against this pest for centuries and human ingenuity has been taxed to the utmost to eradicate it, rats are still with us and their numbers and destructiveness have been only slightly diminished or decreased. Preventive measures perhaps are more important than curative measures if any marked success in exterminating the rat is to be achieved.

The first and most important thing to remember is that less food means fewer rats and no food means no rats. Garbage and refuse should be placed at all times in tightly covered metal containers. These should be emptied at frequent intervals and the contents should be properly disposed of. Foods of all kinds should be kept in closed containers. Food should not be left lying around dog kennels and even pig pens should be kept more sanitary than one finds most of them. Rats can be excluded from these environments by proper screen wire enclosures.

The permanent exclusion of rats involves depriving these pests of a home. Dwellings and buildings should be of rat-proof construction. Concrete cellars and foundations have proved so valuable in aiding the elimination of the rat that an ordinance should be enacted and strictly enforced in all communities providing for such construction in building operations. Contractors and builders should not regard rat-proofing details as trivial and neglect to carry them out.

Health Authorities Ever Watchful

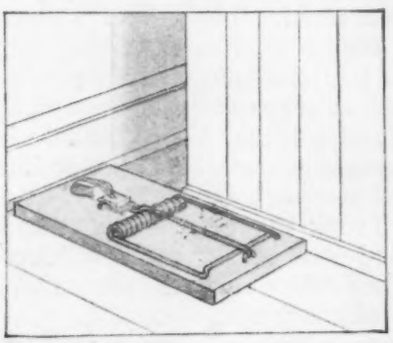
Modern rat-proof shipbuilding is reducing markedly the number of infested ships. Careful inspection, continual watching and proper guards when these vessels are in port have succeeded in preventing rats coming from some distant land and probably infected with plague from making their way inland and finding their way to their fellow rats. Even on the rope used guards must be employed, as rope makes an easy gangway on ships. If the health authorities guarding the ports of the United States and other civilized countries were not persistent in their effort, the deadly plague would be spread far and wide. The appalling indifference of the average man to this problem is deplorable. To him the danger of plague and even the considerable economic loss seem a far cry from his interests until they touch him directly.

All these preventive procedures must be combined with methods of destroying rats, as many places become infested even with these safeguards. Remember that there is no panacea for the rat scourge. There is no quick and easy road to rat riddance.

There are many natural enemies of rats which are probably the most valuable ally of man. Among them owls and hawks

are probably the most important. Owls come swooping down on their prey without making any noise. There are only three species of hawks and owls that live to any extent on poultry and birds, while the other forty odd species subsist mainly on mice and young rats. The weasel and the pine marten are other merciless enemies of the rat. The common or true kestrel and the female ferret are also qualified as natural enemies of the rat.

There are many species of nonpoisonous snakes that are of considerable value to the farmer if he would only let them alone. Snakes found in fields, around grain, and about farms, congregate there so as to catch gophers, mice, rats and ground squirrels. They can even make their way into narrow holes and trap rodents in their subterranean abodes and are therefore more effective natural enemies than the hawk and the fox, which have to wait for the appearance of the rodents above ground. It would be an easy matter for an intelligent farmer to learn merely the differences in gross appearance between harmless and poisonous snakes if the latter were known to be found in his vicinity and then allow the former to go unmolested.



Of domestic animals a good terrier and a good cat if properly trained are worth large sums of money and are almost indispensable. Small fox terrier dogs cannot be excelled as rat hunters and are to be preferred. Cats taken as a class are not of real value as ratters, but when confined in stores, warehouses and plants, certain breeds of cats—the proletarian species, not the feline de luxe—can be made valuable in destroying rats and mice.

Along with the preventive measures of not allowing rat harborage, keeping premises free from rubbish or the use of natural enemies on the farm or a dog or cat in homes, other methods must be employed to destroy rats and keep down the scourge. These are applied by the use of chemical poisons, deadly cultures of disease-producing bacteria, trapping and fumigation.

The ideal rat poison is one that is effective in destroying rats, is cheap and will not menace the lives of domestic animals and human beings. The objections to the use of poisons are that if effective for rats they are dangerous to man or other animals, and that unless a slow acting poison is used the rats are likely to die in inaccessible places, their decomposing bodies causing obnoxious odors.

Poisons most frequently used for killing rats and mice are arsenic, phosphorus, strychnine, thallium, barium carbonate, plaster of paris and powdered red squill. Different vapors and gases have been tried in fumigation technics. The proper vehicle for the poison is important and should be selected with care, as most frequently the kind of bait used is of greater importance than the poison chosen. The bait must be inviting to the rats and the poison must be properly mixed with it.

Red squill most nearly approaches the ideal rat poison, being effective and a specific poison for rats, safe for other animals and comparatively cheap.

Trapping rats is the only procedure to employ when other methods are not advisable or cannot be used. Traps are of many kinds, from a simple type selling for a few pennies to the elaborate and ingenious cage traps selling for several dollars. Complicated contrivances and fancy traps, though useful, may be best replaced by the primitive and simple snap trap known as the "guillotine" or "spring" trap. Generally speaking, the best trap is useless unless baited properly with a satisfactory bait and then placed at night in areas frequented by the rats. Strength, durability and a sensitive and preferably large trigger should influence the selection of the trap rather than its appearance or cost.

Various agents have been employed for the generation of gases, fumes or vapors that are effective for the killing of rats in burrows or other places harboring the pests. Fumigation in many places is not possible but when it can be used and the gas can be confined for a designated period of time, this procedure is the most practicable in getting rid of rats.

Some materials will act as deterrents to rats though they do not destroy them. Of marked value as a deterrent is the liberal use of flake naphthalene (so-called flake camphor). On account of the odor it can be used only in places in which this is not objectionable or when the material to which the odor adheres can be thoroughly aired before use. Powdered sulphur, capsicum, pepper, oils of wintergreen and peppermint, carbolic acid and cresol, gasoline and kerosene and other wood and coal tar derivatives are substances objectionable to rats and can be blown, sprinkled or sprayed in burrows, between floorings, walls and other rat harbors.

Fighting the rat should not be looked on as sectional crusades against an undesirable pest. Rats are just as damaging today as they were centuries ago and from an economic standpoint we sustain greater losses today as a result of the rat's ravages than during any time since the beginning of civilization. To rid environments of rats requires not only individual effort but frequently an organized campaign with united action by the community at large is necessary to insure permanent relief.

Teaching Health to 10,000 Children

By Martha C. Allis

Underwood and Underwood

A playground project built and assembled by kindergarten children in St. Louis.

FIVE years ago the Pulaski County Tuberculosis Association, Arkansas, arranged with the board of education to put on a health education program by way of a demonstration in the Little Rock public schools. Accordingly, a health director was engaged and placed in charge of the work. It was not an easy task that was set before her, because no two persons in the community had the same idea of just what a health education program should consist. There had been no definite, organized health program in the schools. There was no school doctor, no school dentist and the free clinic at which children could get corrective work done was of limited capacity.

Facing these problems, the director began to work out a method of approach. Principals and teachers were enlisted, doctors were consulted, and back of it all stood the superintendent of schools, who was a constant adviser and consultant. Out of these combined efforts the health program was launched, based on this belief: that to succeed it must be a program that would hold the interest of the child in his own health. Health must be made such an attractive goal that the child would desire it, would work for it, and leave no stone unturned to reach the 100 per cent mark. The health director knew that if the child could be won, it would be an easy thing to enlist the interest of the parent, and as soon as the teachers found that the program was workable and based on scientific facts they, too, would be for it.

Toward this end a health score card was devised. This score card gave a picture of the 100 per cent child, with twenty-five points to be scored each month. The score card gave a definite, tangible goal. If the child did not measure up to 100 per cent, he knew exactly where he fell down and why. Each month a fresh opportunity was given to improve last month's record and finally reach the goal.

The health program was carried out in sixteen white and seven colored schools from the first through the sixth grades, reaching approximately 7,000 white and 3,000 colored children.

A Japanese garden inspired the decorator of this kindergarten room in a school at Evanston, Ill.

Photo courtesy The Nation's Schools

While the school health program needs doctors, dentists and nurses, there is no one who plays such an important part as the teacher. In the primary grades, the teacher gives a daily inspection and health lesson. In the fourth, fifth and sixth grades, there is a health teacher for the group who gives the health lesson and inspection. While it is the definite task of the health teacher to teach health, she is assisted in every way by each home room teacher in the school.

At the beginning of each term, the nurse, teacher and health director inspect and score children for glands, tonsils, mouth breathing, skin, symptoms of malnutrition and postural defects; they make vision and hearing tests and record the present health habits, and the dentist examines the teeth. All symptoms of defects found are listed on the teacher's daily health book, and a warning notice is sent to each home, advising the parents that the child shows symptoms of certain troubles, asking that the child be taken to the family doctor to see if this trouble exists, and, if so, to have the correction made. Information is brought back to the teacher from parents and doctors, and this is checked in the teacher's book, thus giving the teacher a complete picture of the child's physical condition. If the parent is unable to take the child to a family doctor and if no interest is manifested, the nurse makes a home visit and tries to get the cooperation of the parent.

Improvement in Health Habits of Children as Result of Demonstration

	Sept., 1925 Per Cent	April, 1930 Per Cent
Having medical examinations	8	88
Having dental defects	98	12
Having tonsil and adenoid operations	7	36
Getting 10 hours' sleep—windows open	61	96
Getting 1 quart of milk daily	21	91
Eating green vegetables	46	96
Eating fruit	89	96
Up to weight	13	95
Drinking tea or coffee	82	1
Eating candy or trash between meals	92	2
Attending movies on school nights	87	4

In order to train for better health and stronger bodies we must teach health and teach it well. So while our health program is twofold—that is, teaching and getting physical corrections made—it is the result of the teaching that enables us so to interest the child that he will get corrections made.

The book used in this program is one written by the health director and health teachers. It is divided into three parts and the first part tells how to build the body. By the time the child comes to school, he is old enough to learn that he is his own body builder, and just as he builds so will the finished product be. This part of the book includes the study of foods. Part 2, the functions of the body, shows how foods are used by the body, the work of the blood and the need of fresh air and sleep. Part 3, the care of the body, considers the care of all parts of the body,

The health story hour in first grade, at an Oak Park, Ill., public school.

Keystone View

sanitation and cleanliness. Thus the child gets a knowledge of his own health problems.

One of the interesting things about this program is the fact that every child knows his defect or failing and is working hard to get rid of it. The child's interest is so keen in regard to his own condition that the health director on her visit to the schools is met on every side with such expressions as these: "I am 100 per cent now because I got my teeth fixed," or "I am 100 per cent because I had my tonsils removed." Another informs her that he is going to bed early in order to get rid of the dark circles under his eyes. The health director was in one school and, upon looking at a little 6-year-old's teeth, asked, "Where did you get all these bad teeth?" The answer was, "My mama did not give me enough lime when I was a baby."

Keystone View

Working out a health project in a Chicago kindergarten.

At every school you will find teachers and pupils working like beavers to get as many perfect children as possible in each room. Each May Day a health parade of the 100 per cent children is given in which the governor, state and city officials, teachers and parents review the parade. It is led by the boys and girls selected as the healthiest children in the schools. This year more than 5,000 children out of the 6,600 were in the parade. A large cup is given to the school having the greatest number of children in proportion to enrolment, while an individual cup is given to the girl and boy selected as the most nearly perfect in the city. Every child taking part in the parade has had all his physical and dental defects corrected, is up to weight and abides by the health rules. This year 75 per cent of the children marched in the health parade.

While we do not get as many corrections with the Negroes, still we are making rapid strides in the schools for colored children. The health director holds classes for the Negro teachers. These teachers, in turn, are trying to instruct the children. It is obvious that the work is successful with them. They come to school cleaner. Each child has milk in his diet daily. No longer do their meals consist of bread, meat and molasses. Gardens with greens are in evidence.

Every child owns a tooth brush and keeps his teeth clean. Ninety-five per cent of the Negro school children in the schools now have their teeth in perfect condition. It is an interesting observation that Negro children in Little Rock have fewer decayed teeth than the white children.

A comparison of figures in questionnaires sent to parents in September, 1925, and again in April, 1930, is made in the table on a preceding page.

The five year report shows that 18,553 children had dental corrections; 2,500, tonsil and adenoid operations; 2,171, eyes corrected, and 5,327, other corrections.

In looking back over the five years that this demonstration has been carried on in the schools, we can definitely see these accomplishments: every child knows his goal, every child is trying to attain it, every teacher is on the alert to have every child's defects corrected so that her entire room can be 100 per cent in health. The teachers themselves have a greater health consciousness and a larger vision since they have been teaching health and are trying to live accordingly. The parents are responsive and no longer does a note come back saying that they expect the teacher to teach the child only and the home will take care of his other needs. Parents are now anxious to have assistance. Nurses report an entirely new attitude when they make home visits. The parent now is asking the nurse's advice and often telephones the schools to have the nurse come. We now have a part time school doctor, a dental clinic for both white and colored children, and practically every child under the age of 8 years has been immunized for diphtheria. The Parent-Teacher Association assists in every way possible, providing milk and lunches for children who cannot afford them. We have succeeded in getting dental care for the first teeth. No candy, except of the pure, wholesome variety, is sold in the schools and the child takes that only after the noonday meal. A survey of the 100 per cent children shows that the attendance, scholarship and citizenship is from three to four points higher than in the other children.

There has been built up a health consciousness in the entire community, not only in Little Rock, but in the county and the state as well. We believe that a health program is of inestimable value and that no matter what conditions are met in the beginning, if the program is based on sound facts with patience and untiring effort the program will go over as this one has and become a definite part of the school system. Not only will this generation be better, but never again will there exist as many health handicaps as were found in the present generation.

Warns Against New Antifreeze Mixture for Motor Cars

A NEW hazard from a poisonous gas is seen by *The Journal* of the American Medical Association in the proposed use of methyl alcohol, or methanol, as an antifreeze mixture for automobiles in winter.

Methanol is a volatile, cumulative poison. When taken in frequently repeated small doses it induces blindness; in larger doses, whether by the stomach or lungs, it may cause death. The greater part of any quantity of methanol that reaches the lungs is absorbed and the dose sufficient to cause poisoning is not large.

Animals Died from Effects

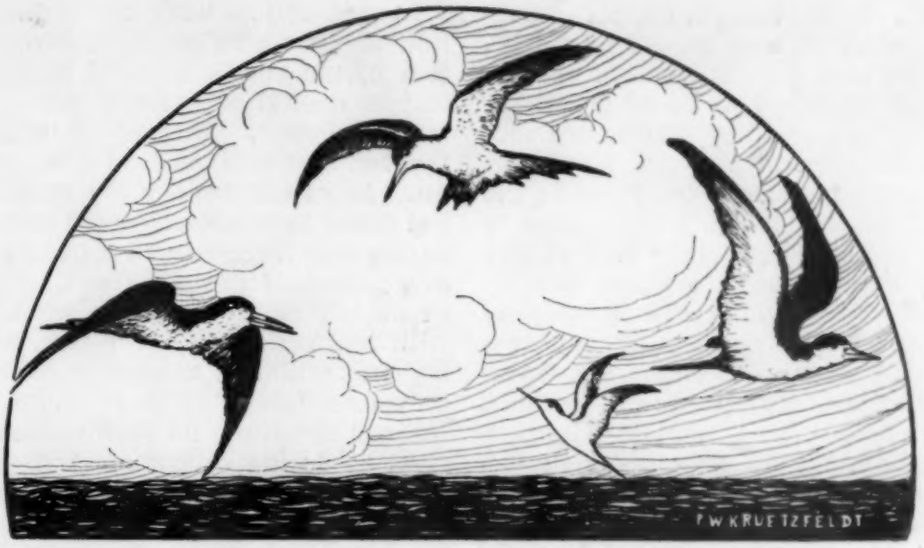
An investigator at the Harvard Medical School several years ago compared the effects of ethyl alcohol and synthetic methanol (methyl alcohol) in a test on animals. Animals that received ethyl alcohol were less strongly affected by succeeding doses, whereas those receiving methyl became more deeply poisoned with each dose. After the third or fourth administration of a comparatively large dose the animals passed into a state of coma in which they died.

The more highly developed nervous system of man is more seriously affected by methyl alcohol than is that of the lower animals, and permanent blindness has often been reported from single, sometimes small doses of methyl alcohol, whereas such results are unknown with ethyl alcohol.

Blindness and Death May Result

It has been asserted that synthetic methanol is not poisonous because it is a pure product. This is entirely erroneous, says *The Journal* editorial, since the truth is that in any preparation of methanol the toxic substance is the methanol itself.

If, as now seems probable, methanol is widely sold for use in automobiles during the coming winter, and if precautions and warnings in regard to the dangers of inhaling its fumes from heated radiators are not instituted, it is highly probable that many cases of blindness will result and probably also fatalities, warns *The Journal*. The public should be protected by law against its own ignorance of such matters.



How Our Senses Help Us

By William J. Mayo

FULL of pride, man has congratulated himself that he is a superior being, having no true relationship to others of the animal kingdom. From the time of Aristotle, who gave the first classification of animals, down through de Lamarck, Linnaeus and Cuvier, attempts at an adequate classification of members of the animal kingdom have been made. Scientists—for instance, Huxley—have aided through criticism in a better understanding of man's position in the universe. A system that is pretty generally accepted is that of Parker and Haswall. All these classifications, however, are based on certain characteristics which are visible to the eye but which may not be fundamental to the group, and the introduction of a double classification, in which Latin can be used, gives an appearance of probabilities which the facts often deny.

Every form of life is affected by environment. The tree that most quickly fixes its roots and reaches up into the sun's rays grows at the expense of its neighbor, and the neighbor, in its turn, bends its energies to get what part it can of the necessities of life. And now we are told that trees have a nervous system which is intimately connected with light, a tree consciousness. In the animal kingdom, from the protozoal organisms of a single cell or of several cells of the same type up to the highest forms, it is evident that environment is responsible for adaptations to secure proper food and to reproduce kind, and that fear may be behind the production of the poisons by which various animals protect their existence.

Insects are a fascinating group. It has been said that in lower animal life adaptation to environment has been the vital spark, and that in man it has been intelligence. Yet it is surprising that in many insects there is a nervous system connected with the perceptive organs of special sense, and man certainly is greatly influenced by the primitive emotions of his unconscious nervous system, which had its origin in the so-called instincts of the lower animals.

The insect wears its skeleton on the outside for protection and in its wings, and the part of its anatomy that takes the place of the spinal column is in front, whereas its organs of circulation and digestion are behind. The circulatory fluid in insects is white or yellowish and is contained in a rhythmically contracting tube or series of tubes. Oxygen enters through tracheal breathing pits or projections, of which there may be thousands in all parts of the outer surface. The sense of smell in insects is often extraordinarily acute, beyond that of man. Like the breathing pits, olfactory centers may exist in any place or in many places on the body, and this is true also of the organs of sight and hearing. Fabre, who has made an accurate study of many of the insects, pointed out evidence of intellectuality in certain types.

In the vertebrates, the hemoglobin of the blood contains one atom of iron to the molecule,

to carry oxygen. In the insects, copper apparently takes the place of iron in this exchange.

Chetverikov pointed out that man's earliest enemies were all supposed to be of great size and strength, the grass-eating vertebrates and the carnivora that preyed on them. Evidences of these early monsters are to be found in the geologic strata. It has taken a long time to learn that it is not size but rather lack of size of his enemies that is man's greatest danger. The various forms of minute organisms inimical to man, which thrive by their inconspicuousness or invisibility and their extraordinary adaptability to all conditions, run up into the trillions.

Human emotions are fundamental. They are the growth through untold ages, as man has advanced from a cell, of those characteristics that we speak of as instincts in lower animals. They are the very center of man's being and originate in the middle of the brain, the neopallium, on which the higher intellectual functions have their foundation.

The emotions are hereditary. Capacity for education is hereditary. Man may learn by education to control his emotions, but in times of stress, or under mob psychology, they may break loose and register acts that are beyond what could possibly be expected. Too often we think of education as the predominating influence of life, but education can be given only to the extent of the hereditary capacity for learning, and although it may teach control, it does not nullify those common characteristics of life, the emotions.

Buckle, who wrote a classic history of civilization in England, the introduction of which filled two great volumes, and who died at the age of 36 before the work was completed, laid down the law that the great human emotions concern (1) food, (2) propagation of the species, and (3) fear. Pavlov, the great Russian physiologist, recently came to the same conclusion.

Limiting Our Population

The modern outlook stresses these prime and fundamental natural laws and the Malthusian doctrine of limiting the population to the food supply and to those peoples who are like-minded with the race from which they sprang.

By immigration acts we have prevented the yellow races from becoming citizens of our country. Older than we, they have acquired greater resistance to many types of diseases that are caused by micro-organisms; they have become more resistant to bad hygienic surroundings and can live on foods that are unsuited to the Caucasian race.

In connection with the Asiatic peoples we talk about world peace, but our fundamental fear of the yellow races is based not on physical or mental superiority but on their numerical advantage. They breed so prolifically that the fundamental natural law of food supply must be considered by the nations less prolific but more favorably situated as to food. Starvation may force war, in spite of scraps of paper or gestures of peace. The Caucasian race has no such fear of the Indians. A younger race, with less resistance to disease, without natural hygienic training, accepting sanitary conditions only as enforced by their white neighbors, the Indians constitute no such menace to the white race, as do the yellow races.

The emotion of fear in ancient times was shown by the multitude of gods to whom were offered prayers for protection from the unknown, and today is shown by the various cults that come and go in spite of education. It was fear that urged civilization forward, that brought man up on his feet and loosed his hands for protection and to secure food.

Undoubtedly the hands have contributed more to the development of the brain of man than have any other single anatomic feature. In man the sense of touch, which is a pressure sense, commonly refers to the hands, which the upright position of the body has freed for highly specialized training.

It is interesting to follow what Sherrington called the external receptors as related to the brain of man. Receptors, the earliest form of nervous system, receive impressions from surroundings and activate other structures. Sherrington has defined a receptor as the peripheral apparatus that receives a stimulus.

The Five Special Senses

Man's receptors that have to do with distance consist of the organs of the five special senses, touch, taste, smell, hearing and sight. All the special senses have their origin, from the standpoint of embryology and comparative anatomy, in the external envelops that afford protection to the organism.

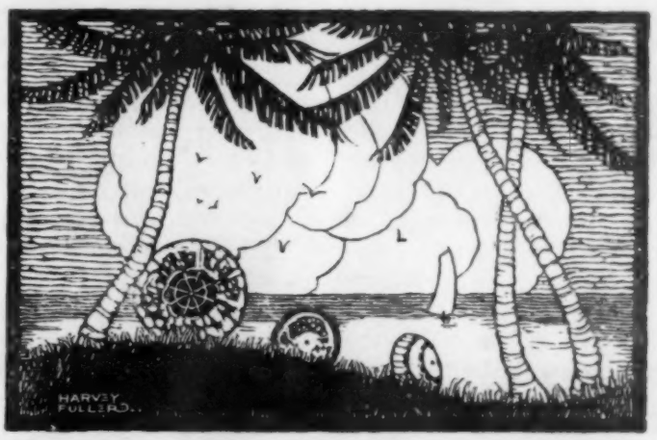
As animal organisms gradually became more complex, receptors, the organs of the special senses, became more or less connected with the cerebrum, the sense organ of intellectual life, which had its origin in the olfactory ganglion of the invertebrates. The neopallium, that part of the brain that did not originate in the olfactory ganglion, gives a fuller representation of all the senses and carries on the conscious as well as the unconscious activities in the control of the mechanism of life.

In the lower animals (nonprimates) the sense of smell controls behavior, because it is the only sense directly connected with the expanded olfactory ganglion, which in them represents the cerebrum. The other senses are relayed, so to speak, through various centers, and may be garbled in transmission.

Man's Mental Superiority over Monkeys

In the primate, man, the cerebral cortex, which is the seat of intellectual functions, underwent huge expansion. This expansion came coincidentally with the development of vision, dwarfing the olfactory sense. Vision thus secured direct access to the cerebral cortex. The monkey, the ape, the lemur and the marmoset, although primates, made little use of the developing visual brain, unlike man, and did not gain greatly in intelligence. They took to the trees for safety and remained herbivorous. Osborn tells us that man separated from the ape perhaps 50,000,000 years ago, and that the progenitors of man and the ape separated from the lower vertebrates an unknown length of time before that.

The gray matter of the cerebral convolutions records and classifies impressions, analyzes experience and activates emotion. Intellectual functions cannot be ascribed entirely to the special senses, but are rather the sum total of both external and internal sensory impressions interwoven into a complex mechanism controlling behavior.



The sense of taste and the sense of smell are chemical senses and are closely allied. The sense of taste depends largely on nerve endings in and about the tongue and is perhaps the least important and the least delicate of any of the special senses, recognizing only four types of food or modifications thereof: sweet, sour, bitter and salty. The qualities ordinarily known as flavors are not dependent on the sense of taste, but on the sense of smell, which is extraordinarily delicate, recognizing ultramicroscopic substances suspended in the air as vapors and gases. The sense of taste alone could not distinguish an onion from an apple.

Perhaps the reason for failure of the sense of taste to measure up to that of many of the lower animals is that the mobile tongue of the lower vertebrates is used not only to bring food into the mouth and to aid in mastication but also to determine the edibility of various materials. The tongue of man is not a descendant of the tongue of the lower vertebrates. The mobile portion is for the purpose of speech as well as deglutition and is a more recent acquisition than the posterior portion, as shown by the fact that it has no memory. One bites the tongue; it hurts exquisitely for a few moments and is quickly forgotten.

The olfactory cells on which the sense of smell depends are arranged in bundles and each cell has a hairlike ending. The function of these hairlike endings may be to recognize as odors the impact of molecular colloid substances in gases and vapors (either from size or rapidity of motion) just as differences in the speed and length of rays of refracted light are recognized by the eye as colors of the spectrum.

Our Sense of Smell Is Small

The sense of smell in man is represented by only about one square inch of pigmented olfactory nerve cells, a small amount as compared with the olfactory organ in many of the lower animals. In the hound, for example, this sense is exceedingly accurate, whereas the sense of sight is defective. The approximate location of the quarry is determined by its odor, but the exact location is visual, because the sense of smell does not possess the faculty of recognizing time, space or motion. The deer recognizes its enemy by the characteristic odor carried by air currents an almost incredible distance. It is interesting to note that the new-born fawn has no odor during the early days of its life, and thus is protected against its enemies in the days of its helplessness. The pigmented cells are necessary to convey odors to consciousness. Pure albinos have no pigmented cells and therefore they have no sense of smell. Sheep-raisers send the albino lambs to the butcher, because it is known that they cannot distinguish between noxious weeds and proper food and sooner or later would die from poison.

The sense of hearing is to a certain extent a pressure sense. Fish have a so-called sixth sense situated in the lateral-line labyrinth organ of Leydig, which enables them to appreciate pressure, depth and equilibrium. The ear in land animals responds to sound waves and pressure changes in the air as that of the water vertebrate does in water. This sensitiveness to change in air pressure will be noted on the descent from a mountain to a lower region, and in the length of time a sound requires to reach the ear, about 12 miles to the minute. The relation of equilibrium to the fluid contained in

the semicircular canals is an evolution from a water vertebrate to a land vertebrate. Seasickness is the result of disturbance of equilibrium. A cat, dropping from a height, lands on its feet and in the process of righting the body during the fall the head turns first, as a result of the speed of the reflex mechanism of the labyrinth.

The organ of Corti in the ear contains certain fine hairs about which little seems to be known, although Helmholz sixty years ago suggested that the varying lengths of these hairs might have to do with the recognition of tones. Our knowledge of the radio, little as it is, suggests that the possible function of these hairs on the organ of Corti is to receive vibrations in the air and to distinguish certain wavelengths as pitches of sound. The sense of hearing in certain of the lower animals is more acute than in man. The bat hears the wing tones of insects pitched in a key beyond recognition by the ears of man.

In one respect the sense of hearing and the sense of smell are unlike. The sense of hearing as a rule diminishes with age, whereas the sense of smell often grows keener; it is usually more delicate in women than in men.

Vision Brings Us 95% of Our Knowledge

Picturesquely speaking, 95 per cent of man's information is obtained either directly by visual means or indirectly through visual training of the other special senses. The direct connection of the eyes with the cerebral cortex controls behavior in man and not the superior mechanics of the eye, which in many respects is inferior to that of the lower animals. For instance, if man had the telescopic vision of the eagle, he could read print at 500 feet. In many of the lower vertebrates each eye sees independently and in only two diameters, length and breadth, whereas in man binocular vision gives sight in three diameters, length, breadth and depth. The snake has no macula lutea and sees only objects in motion.

The introduction of the microscope by the Jannsens in 1590 revolutionized medicine. This discovery came too late to benefit Harvey (1578-1657) greatly, but it gave the hand lens to Hunter (1738-1793) and the modern microscope to Lister (1827-1912) and Pasteur (1822-1895).

Through ultramicroscopic but visual methods, by means of physics and chemistry, a new advance in medicine of equal importance to the invention of the microscope is being made. With the x-ray the atom has been analyzed. Through modern colorimetry, methods have been perfected for making various laboratory tests of the greatest value.

Ultramicroscopic methods are enabling a biochemical study of man and his diseases that is showing extraordinary results in overcoming diseases that formerly were mysterious and in preventing changes that shorten life. Think of the revelations of the great telescopes in the studies of the heavenly bodies and our new knowledge of the earth's surface from the use of aircraft.

Photography has been so developed that in $\frac{1}{12,000,000}$ of a second a bullet in flight with a muzzle velocity of 3,000 feet a second can be photographed as if it were standing still. Through such photographic records the eye can make its investigations at leisure.

The value of vision lies not alone in sight, but in education of other senses as well, as exemplified in Helen Keller, Ole Bull and a host of others born without certain special senses but with wonderful intelligence when trained by the eyes of the educator.

Intuition May Be Called Sixth Sense

If there is a sixth sense, it is intuition, that instinctive summing up of memories and other evidences collected by the special senses and correlated in man's consciousness.

It has been well said that what man sees he can understand; what he cannot see is a mystery. The whole history of mankind shows the gradual growth of ability to understand because of the increasing ability to see.

SIMPLE LESSONS *in* *Human Anatomy*

By B. C. H. Harvey

LESSON XVI. GLANDS OF INTERNAL SECRETION—PHARMACIES WITHIN THE BODY

WHILE the nervous system coordinates the many and varied activities of the body regulating them so that all the parts act together as one individual organism, each part and indeed each living cell has an individual life. It has to be alive, or it would not have any activity to be regulated. Its individual life involves various physical, chemical and biologic processes; it assimilates nourishment and gives up waste products. It must have proper food. But it must also have something more. It must have certain drugs; that is, small quantities of certain chemical substances. They are not food—the amounts needed are too minute to be simply food—and yet they are absolutely necessary. Without them the complex vital processes go wrong or stop.

Some of these drugs are supplied in the food, and since 1905 we have called them vitamins. About 1885 the Japanese discovered the necessity of one of them. It is in the husks of rice and other grains. Without it many soldiers in their army developed a disease called beriberi. Other vitamins have been discovered since then. Five are fairly definitely known. They are called vitamins A, B, C, D and E. And even though men are otherwise well fed, without A eyes go wrong, without B nerves go wrong (neuritis and beriberi), without C general nutrition goes wrong and teeth decay, without D bones go wrong (rickets), and without E they never have any children.

But not all the drugs needed are in food, even when it is abundant and when the vitamins are all present in it. For many drugs are entirely or partly destroyed in the stomach and intestines and there would be little or no use in swallowing them with the food. Before they could get into the circulating blood they would be so changed that they would not have the necessary action on the cells and tissues to which the circulating blood takes them, and to some of which they are indispensable. These substances have to be formed inside the body. They are formed in all vertebrates by glandlike masses of tissue which are called glands of internal secretion, because they secrete their product directly into the blood stream.

Six of these glandlike bodies have been demonstrated clearly to be present and active in the human body. They produce chemical substances which are given up to the blood stream and carried by it to all cells and tissues. They have special affinities, probably chemical, for some tissues, and so are picked out of the circulating blood as it goes through that tissue, which may be in a part of the body far away from the gland producing the drug.

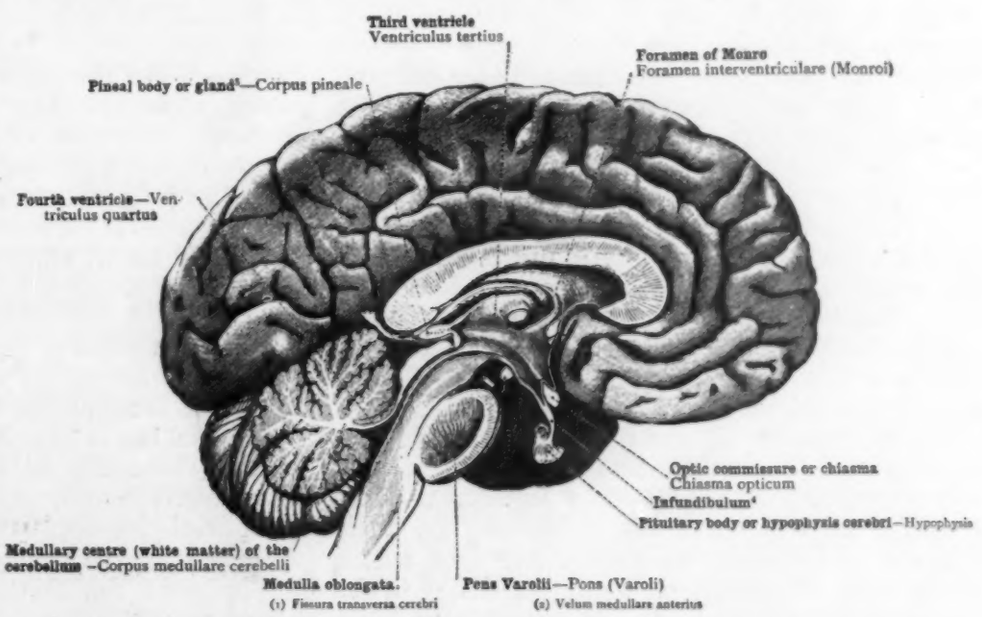


Fig. 202.—Median section through the brain stem and cerebellum, showing the hypophysis, its stalk and its relation to the x-shaped crossing of the optic nerves (chiasma opticum). (From Toldt's Anatomy, The Macmillan Company.)

The glands that have been clearly proved to produce drugs of this kind are the hypophysis, the thyroid, the parathyroids, the "islands" in the pancreas, the suprarenals and the gonads (the ovary or testis). The drugs produced by them are called "hormones," or chemical messengers. Schäfer calls them autacoids, or "self drugs," which would be an even more appropriate name, but the term "hormones" is too well established to be displaced. Some of the hormones have been isolated chemically; others have not been so identified. All have definite and characteristic effects, which are produced often by astonishingly small doses (1/30,000 grain in one instance). They are interchangeable between different vertebrate animals: those taken from one animal produce their effect in others; we can and do give to diabetic men extracts of the pancreas (insulin) of a fish. To the hormones, the bodies of men and other animals are of one kind.

For healthy life and growth all these hormones are essential, but those of the suprarenals and parathyroids are so vitally and constantly essential that animals deprived of them die in a few hours or days. Even though animals are otherwise well fed, without the hormones of the hypophysis, the skeleton and connective tissues do not grow; without those of the thyroid, the body becomes puffy and the brain sluggish (cretins); without those of the parathyroids, convulsions and death come on in a few days; without those of the pancreas sugar is not burned in the body cells and accumulates in the blood (diabetes); without those of the suprarenals, muscular weakness and death follow (Addison's disease); and without those of the interstitial cells of the gonads, neither maleness nor femaleness develops, body and character remain asexual.

Small amounts of the proper hormones prevent or relieve these conditions. In this respect hormones are like vitamins, but in another respect there is a great difference in their actions. Excess of vitamins in the food seems to have no effect, but excess of hormones in the blood produces conditions the reverse of those just indicated. Their effect seems to be in proportion to the amount of them present, even though the amount is small. Therefore there is need of delicate regulation of the activity of these glands, and since all of them have nerves from the sympathetic or parasympathetic systems it is likely that they, like other organs, have their activity regulated largely by the nervous system.

It is likely that there are more than these six pharmacies in the body—perhaps many more. Many more are being written about now, but there is too much speculation and not enough established fact to justify the inclusion of others in this discussion. The pineal gland, the liver and the thymus are among the others which, some investigators believe, produce hormones. Extracts of some of these glands (thyroid and perhaps suprarenals) when swallowed in large amounts produce effects that are like the effects of their injection into the blood vessels in small amounts.

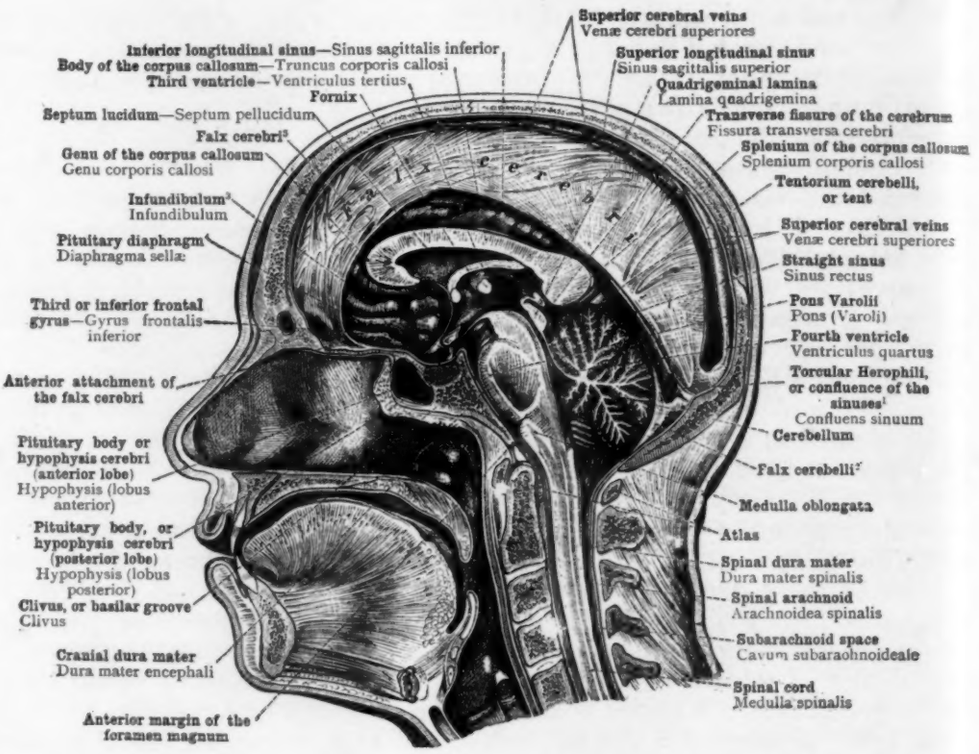


Fig. 203.—Median section through the head, showing the hypophysis in its bony fossa. (From Toldt's Anatomy, The Macmillan Company.)

Gland That Grows Under Brain

The hypophysis, a ductless gland about as big as the kernel of a hazel nut, hangs down from the base of the brain to which a slender stalk attaches it (fig. 202. See also fig. 160). It is almost exactly in the middle of the brain's lower surface and, as it hangs down a half inch, a special hemispherical fossa is formed to receive it in the base of the skull (fossa of the hypophysis, fig. 203). This fossa has a flat cover over it, like a lid on a pot, made of tough fibrous membrane—the dura mater. But the lid has a hole in the center through which

passes the stalk of the hypophysis. This stalk is attached to the brain just under the floor of the third ventricle and behind the x-shaped crossing of the optic nerves (fig. 160). Through this hole arteries and nerves go down around the stalk to reach the gland. The lid protects it from pressure. The same dura mater which surrounds the brain encloses the hypophysis. Because the hypophysis was wrapped up with the brain and connected with it by a stalk, it was long regarded as a brain gland, supposed to secrete its product into the brain substance or into the fluid in the ventricles of the brain.

Its History and Structure

A close examination of the structure and embryonic history of the hypophysis reveals some curious facts. It has three main parts: anterior, intermediate and posterior (fig. 204). The stalk is attached only to the posterior part, which alone has a structure like nerve tissue, like the neuroglia or supporting tissue of brain and cord. The anterior and intermediate parts are derived from the lining of the nose cavity, which in the embryo is part of the mouth.

In very young embryos before the mesoderm enclosing the brain has become differentiated into skull, dura mater, arachnoid and pia mater, there grows up dorsally toward the brain a hollow process, resembling a test tube, of the ectodermal membrane lining the mouth cavity. Another hollow process of the floor of the brain (third ventricle) grows down toward it and the two meet, touch and overlap. The meeting place is close to the brain, inside what becomes later the dura mater. The stalk of the mouth process then shrivels up and disappears, leaving the upper end of the process isolated and lying flattened out on the anterior surface of the other process that has grown down from the brain. It expands toward each side, becoming thus like a flattened sac closely applied to the nervous process and partly wrapped around it (figs. 202 and 204).

The cavity in the nervous process disappears in the lower part at the point where the two processes overlap, and thus the hypophysis is made up of three lobes: anterior, intermediate and posterior. Of these the intermediate lobe; that is, the posterior wall of the cleft, is closely applied to the posterior nervous lobe, sending processes into it and spreading upward on the anterior surface of its stalk and backward around it till it almost makes a sleeve for it.

The minute structure of the anterior lobe is shown in figure 205. It contains three kinds of cells and many blood capillaries which because dilated and irregular in shape are called sinuses. The cells, because of their reaction to dyes in the preparations usually made, may be called the red, white and blue cells. They are actually called the alpha, gamma and beta cells, respectively. The alpha cells are closest to the blood sinuses and are full of granules which are discharged into those sinuses. They are believed to be or to produce the hormone of the anterior lobe. This hormone makes the bones and cartilages and connective tissues of the whole body grow. Sometimes there are too many of these red-staining alpha granules and alpha cells. If this occurs in youth the children grow up to be giants and may be 8 feet tall (fig. 206). If animals are fed large amounts of anterior lobe for a long time, they grow large. Figure 207 shows two amblystomas of the same age: The little one was fed on worms, the big one on anterior lobe of ox hypophysis. Conversely if the anterior lobe is removed from the hypophysis of young animals they fail to grow normally (fig. 208). If the anterior lobe starts excessive growth in men more than 25 years old the bones do not become longer, but coarser and heavier, especially those of hands, feet and jaws. This condition is called acromegaly, and it is caused by tumors made up of an excess of alpha cells. They often become so large as to press up against the brain, especially against the crossing of the optic nerves, just above the hypophysis, and that is why so many acromegalic patients become blind.

Lobe Enlarges During Pregnancy

During pregnancy the anterior lobe becomes much larger in women, perhaps to furnish hormones for the growth of the infant. It never again becomes as small as before, and sometimes becomes so large as to produce acromegalic symptoms, including temporary disturbances of vision during pregnancy. One of the hormones of the anterior part has also an effect on the ovary and it is believed to incite in it the series of cyclic activities involved in menstruation.

The intermediate lobe contains chiefly cells of a uniform type, long or prismatic in shape. But occasionally it contains tiny vesicles full of a gluelike substance and the cells around these are shorter and cubical. This lobe is thin and contains hardly any blood vessels. The granules in its cells are believed to be the source of another powerful drug extracted from intermediate and posterior lobes, which makes smooth muscle fibers contract strongly everywhere in the body. It is therefore used by surgeons to stop hemorrhage and by obstetricians to make the uterus contract.

In the posterior lobe near the intermediate lobe are a considerable number of blood vessels, and it is believed the hormone is secreted into them. This, if true, would explain the intimate union of the intermediate lobe with the posterior —the processes which it sends into it and its tendency to spread around its surface and upward on the stalk. It would explain also the fact that this hormone can be extracted from

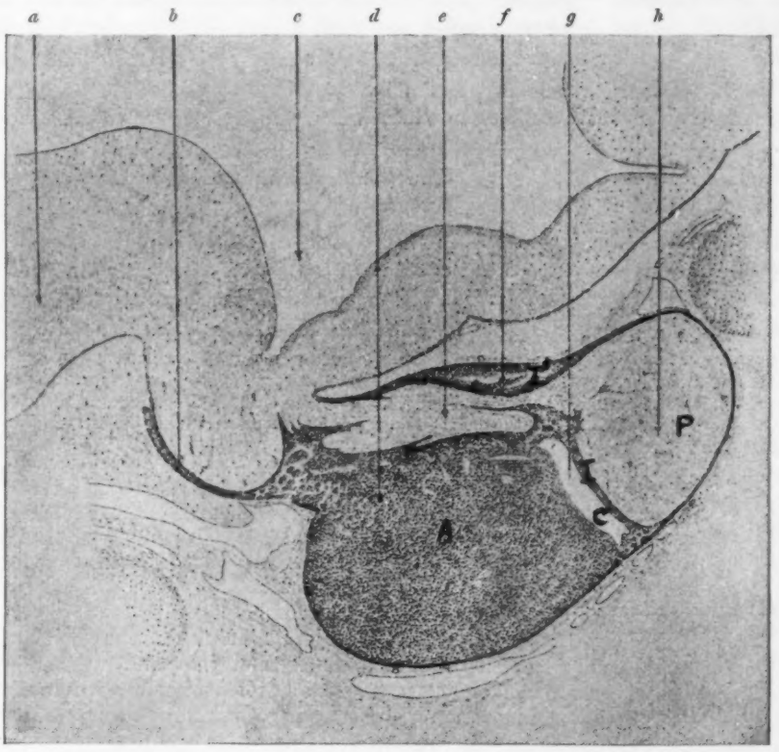


Fig. 204.—Median section through the hypophysis of a human fetus: A, anterior lobe; I, intermediate lobe; I', surface extension of intermediate lobe which has grown round the stalk of the posterior lobe; P, posterior lobe attached to the brain by the stalk; C, cavity between anterior and intermediate lobes. (Modified from Herring, Longmans, Green & Co.)

Fig. 206.—Man, aged 36, with excessively large anterior lobe and hypophysis. He was 8 feet 3 inches tall, with big hands, feet and jaw. (From Cushing.)

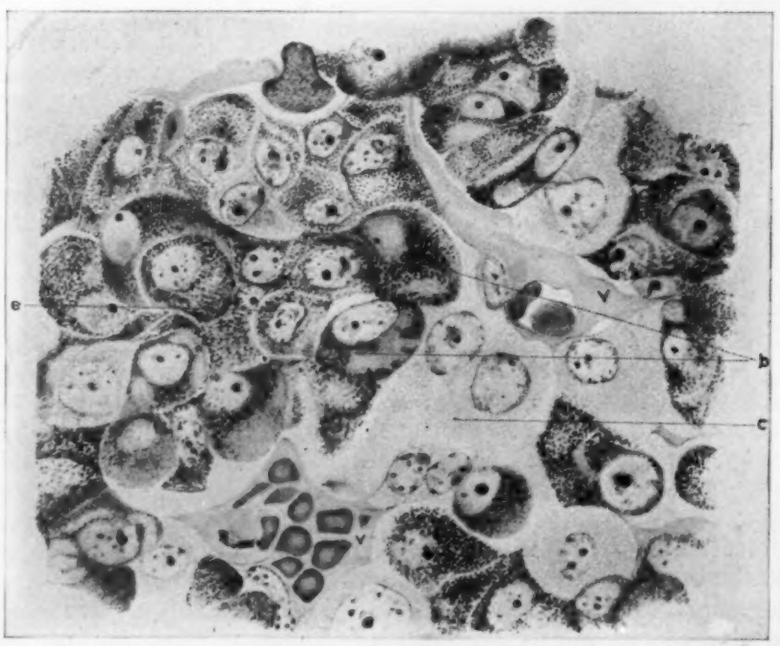


Fig. 205.—Section through the anterior lobe of the hypophysis: e, alpha cells; c, gamma cells; b, beta cells; v, blood vessels. (From Maurer and Lewis.)

Fig. 207.—Two amblystomas of the same age; the little one was fed worms and the big one the anterior lobe of ox hypophysis.

Fig. 208.—Two dogs of the same litter, 1 year old. From the little one the hypophysis was removed when two months old; the big one is normal. (From Oschner in Sharpey-Schafer, Longmans, Green & Company.)

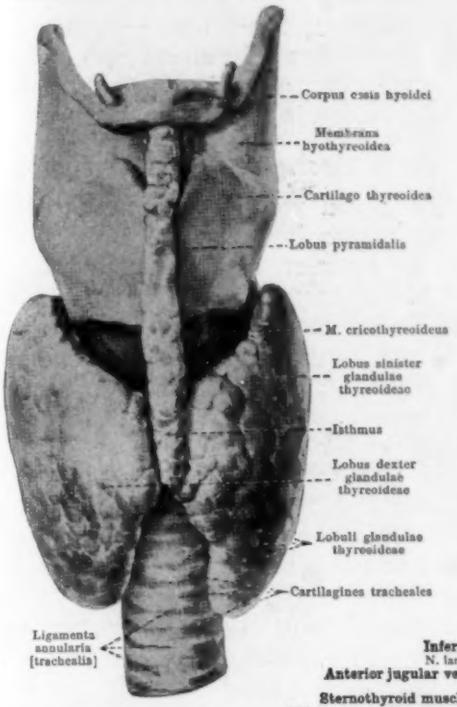


Fig. 209.—The thyroid gland viewed from in front, showing its relation to larynx and trachea. The pyramidal lobe is rarely as long as in this picture. (From Spalteholz' Anatomy, Herzil.)

Fig. 210. — Transverse section through the neck; the spinal cord is in the center. The relationship of the thyroid gland to the trachea, esophagus, carotid artery and internal jugular vein is shown. (From Toldt's Anatomy, The Macmillan Company.)

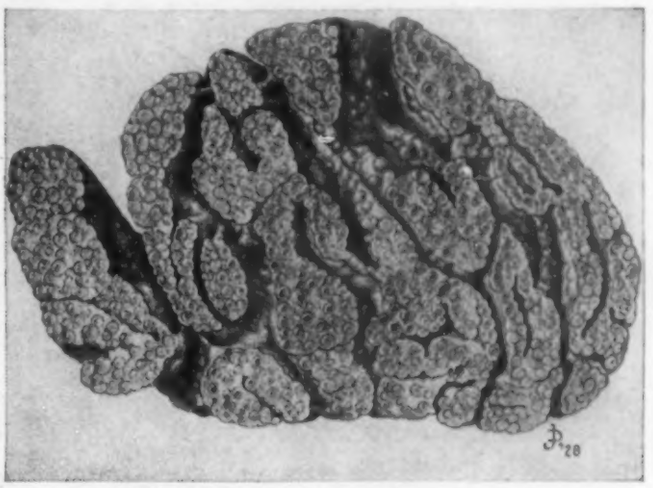
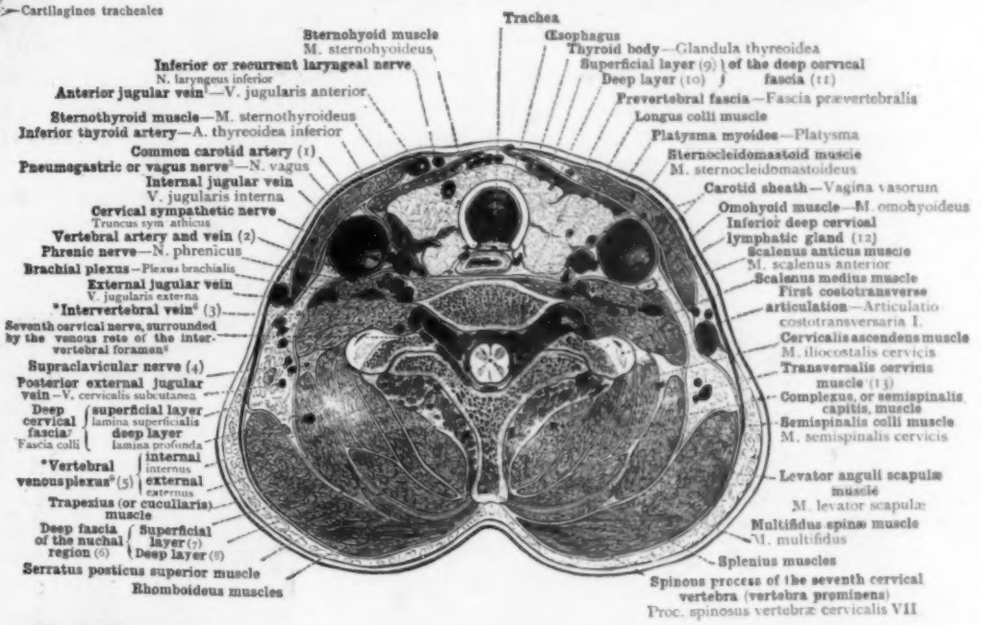


Fig. 211.—Cross section of the normal thyroid gland, showing the spherical follicles. The connective tissue has been removed. (From Maximow-Bloom after Rienhoff, Saunders.)


Trachea
Sternohyoid muscle M. sternohyoideus
Œsophagus
Thyroid body—Glandula thyreoidea
Inferior or recurrent laryngeal nerve N. laryngeus inferior
Superficial layer (9) of the deep cervical fascia (11)
Deep layer (10)
Anterior jugular vein[1]—V. jugularis anterior
Prevertebral fascia—Fascia prævertebralis
Sternothyroid muscle—M. sternothyroideus
Longus colli muscle
Inferior thyroid artery—A. thyreoidea inferior
Platysma myoides—Platysma
Common carotid artery (1)
Sternocleidomastoid muscle M. sternocleidomastoideus
Pneumogastric or vagus nerve[3]—N. vagus
Carotid sheath—Vagina vasorum
Internal jugular vein V. jugularis interna
Omohyoid muscle—M. omohyoideus
Cervical sympathetic nerve Truncus sym. athicus
Inferior deep cervical lymphatic gland (12)
Vertebral artery and vein (2)
Scalenus anticus muscle M. scalenus anterior
Phrenic nerve—N. phrenicus
Scalenus medius muscle
Brachial plexus—Plexus brachialis
First costotransverse articulation—Articulatio costotransversaria I.
External jugular vein V. jugularis externa
Cervicalis ascendens muscle M. iliocostalis cervicis
*Intervertebral vein[2] (3)
Transversalis cervicis muscle (13)
Seventh cervical nerve, surrounded by the venous rete of the intervertebral foramen[2]
Complexus, or semispinalis capitis, muscle
Supraclavicular nerve (4)
Semispinalis colli muscle M. semispinalis cervicis
Posterior external jugular vein—V. cervicalis subcutanea
Deep cervical fascia: superficial layer lamina superficialis; deep layer lamina profunda; Fascia colli
Levator anguli scapulæ muscle M. levator scapulæ
*Vertebral venous plexus[2] (5): internal internus; external externus
Multifidus spinæ muscle M. multifidus
Trapezius (or cucullaris) muscle
Splenius muscles
Deep fascia of the nuchal region (6): Superficial layer (7); Deep layer (8)
Spinous process of the seventh cervical vertebra (vertebra prominens) Proc. spinosus vertebræ cervicalis VII
Serratus posticus superior muscle
Rhomboideus muscles

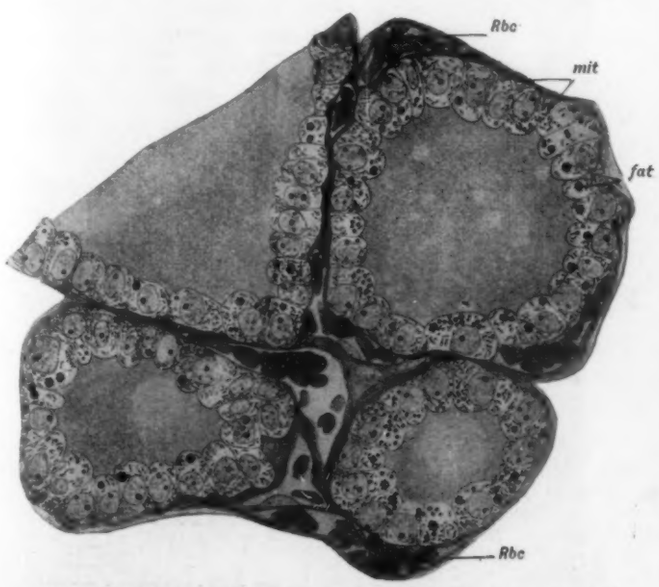


Fig. 212.—Section through several follicles of the thyroid gland; mit, little rod-shaped bodies within the cells; Rbc, red blood corpuscles in capillaries. (From Maximow-Bloom after Bensley, Saunders.)

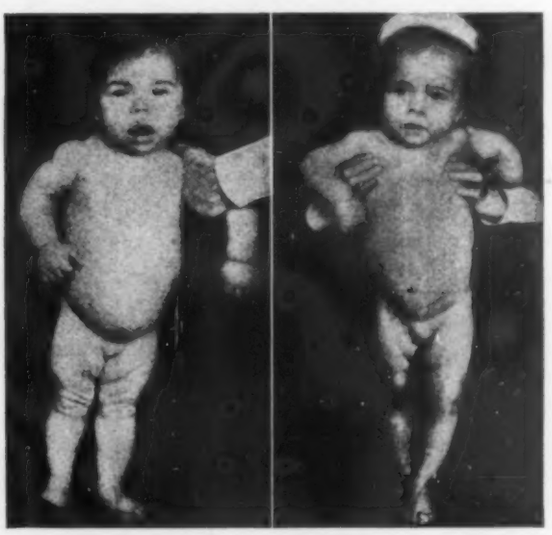


Fig. 213.—A cretin, or a child with a deficient thyroid gland, before and after treatment with thyroid gland. (From Sharpey-Schafer after Bramwell, Longmans, Green & Co.)

the posterior lobe after the intermediate has been (as far as possible) removed from it.

The posterior lobe contains only cells ordinarily found in nerve tissue, or supporting cells. They do not look like secreting cells, and though hormones can be extracted from this lobe, they may get into it from the intermediate lobe.

This account leaves unexplained the close association between the brain process and mouth process. Nothing now known seems to indicate the necessity of this union, or any use at all for the posterior lobe except absorption of hormone by its blood vessels and for that any other blood vessels would seem equally serviceable. Nevertheless every vertebrate animal has a hypophysis and all show this curious association. It seems to indicate that there is something not yet known about this gland which may explain more clearly its constitution and function.

The Thyroid Gland

The thyroid gland is wrapped around the larynx and trachea. It is shaped like a capital H with heavy side pieces and cross bar. Its position is indicated in figure 209. It fills the irregular space which is in front of the air passages and esophagus in the midline and the great blood vessels on either side, and behind the body wall of the neck made by the flat muscles and their fascias (fig. 210). It is soft and plastic, so that it adapts itself to its neighbors and fills accurately this space which changes somewhat in shape in swallowing, in breathing and in movements of the neck. In health it is so soft that it cannot be felt or seen from the surface, but when hardened or enlarged by disease it can be felt and often seen, and in these conditions it embarrasses the movement of its neighbors in their work. This is the condition known as goiter.

The thyroid is enclosed in a thin, but tough fibrous wrapping, which sends processes into its substance carrying many blood vessels. Three and a half times its own weight of blood goes through the thyroid gland every minute. It has many lymphatic vessels also, so it has abundant opportunity to give its product to the blood or lymph. Its fibrous sheath being attached to the larynx, it moves with the larynx as that structure goes up and down in swallowing. Its cross bar, the isthmus, lies over the second, third and fourth tracheal rings, being lower down in short necked people and moving slightly over it as the trachea is stretched in swallowing and breathing.

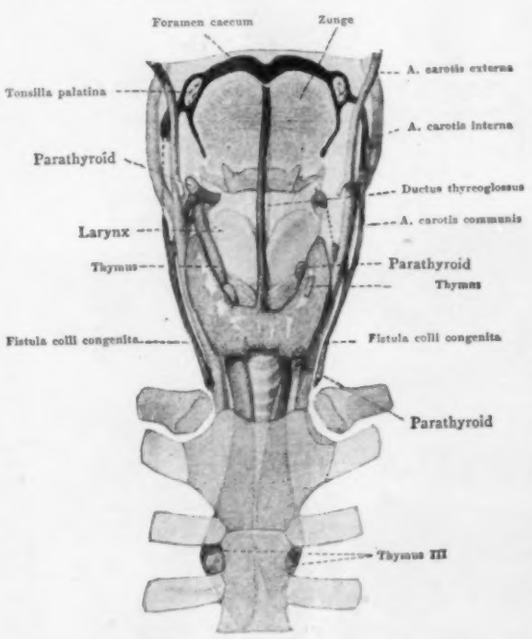


Fig. 214.—Scheme showing the origin of thyroid from the mucous membrane of the tongue; of tonsils, thymus and parathyroids from ducts which are derived from old gill clefts on each side. The thymus and parathyroids come from the third and fourth clefts. These clefts opened externally into a temporary intercepting duct. Sometimes it persists and babies are born with a neck "fistula" opening on the surface. (From Braus' Anatomy, Springer.)

Larger in Women; Is Affected by Diet

The entire gland weighs a little more than 1 ounce, but varies between ½ and 2 ounces. It is larger in women, especially during pregnancy and is larger in some countries than in others. In Switzerland and around the Great Lakes of North America people (and animals) have large thyroids, and this is associated with a relatively small amount of iodine in the food and drinking water of those regions.

The gland is made up of little hollow balls called follicles (fig. 211). Fairly large ones are $\frac{1}{250}$ inch in diameter but most are smaller. A cross section shows that the walls are made up of a single layer of cells (fig. 212). This is a continuous layer and there are no spaces between cells. The interior is filled with a substance like thin glue called colloid. Sometimes there is a lot of it and the vesicles are distended. Then the cells in the wall are cubical or flattened. Sometimes there is only a little colloid; then the cells are long and cylindrical and the wall is thick. The amount of colloid is increased by a meat diet, by giving iodine even in small quantities, by feeding thyroid gland, and by some vitamins in the food. This colloid must be secreted into the cavity by the cells, and when it is reduced in amount it must be taken up again by the cells and given to the blood or lymph vessels. Therefore the cells give up secretion sometimes one way—toward the central cavity—and sometimes the other way—toward the capillaries. The latter are in close relation with the outer ends of the cells (fig. 212), and as the gland has no duct this is the only way by which it can give up its drug product. The colloid contains iodine, so much of it as to make 0.5 per cent of the weight of the thyroid. This is the only place in the body in which it is stored. It is combined in a huge molecule called iodothyroglobulin, from which a drug called thyroxine has been isolated by Professor Kendall of Rochester, Minn. It has many of the properties of thyroid extract. Its formula is $C_{11}H_{10}O_3NI_3$.

This drug in some form has marvelous effect in curing one bad disease: Some children have deficient thyroid glands and then they become cretins (fig. 213). They live too slowly. They are puffy and sluggish. They do not grow normally and are deficient mentally. A short treatment with the thyroid drug, even when given by the mouth, works wonders. They become normal, but of course the treatment has to be continued.

Sometimes, on the other hand, the thyroids become overactive and too much of this drug product, perhaps in an abnormal chemical form, is secreted into the capillaries. Then the patients get exophthalmic goiter. They live too fast. Their eyes bulge out, they are nervous and excitable, their hearts beat too fast and they get thin. To cure them surgeons often take out part of the thyroid gland, leaving, however, the back part of the lateral lobes, because the most important nerve to the larynx or voice box runs along just behind its fibrous sheath, and because there lie just behind it four other tiny glands of internal secretion which are necessary for life; namely, the parathyroids.

The thyroid grows from the floor of the tongue, at the place marked by the foramen cecum (fig. 214). In the embryo this was part of the pharynx—the expanded funnel shaped upper end of the foregut. In figure 86, November, 1929, the first rudiment of the developing thyroid is shown. It grows forward over the hyoid, or tongue bone, and turns down in front of it and of the larynx. Its lower end expands toward each side to form the thyroid gland. At first it has a duct opening at the foramen cecum, and in one primitive fish the duct persists through life. In all other vertebrates the duct disappears; sometimes traces of it may be found in the midline, rarely they may be found in the tongue muscle, and they may be found in front of the larynx (lobus pyramidalis) in one person in every three.

(To be concluded in the December issue.)

We Shall Always Need the Family Doctor

CAN the public get along without the general practitioner of medicine? Why is it that the general practitioner is being supplemented by the specialist and where does the responsibility for this emphasis lie?

The late Dr. Francis W. Peabody of Harvard Medical School asks these questions in one of a series of essays recently published in book form under the title "Doctor and Patient."

Fundamentally the reason for the development of specialism is without doubt the progress made during the last two or three decades in the sciences that underlie the art of medical practice. But other factors enter into the decision of a young physician to confine himself to one branch of medicine.

Chief among these factors, Dr. Peabody believes, is the young student's observation that the specialist appears to occupy a position in the profession and the community at large which is more dignified and more respected than that of the general practitioner. Professionally and socially the specialist is often looked up to as on a higher plane and it is certainly neither unnatural nor discreditable for the young man to desire the career that carries with it the sincere regard and respect of his fellow citizens.

Throughout the country and particularly in the large cities and the adjacent towns the intimate relationship that formerly obtained between the physician and his patient is breaking down because the public is tending more and more to turn to the specialist in the first instance instead of to the general practitioner. The feeling seems to be that since the specialists know so much and are the ultimate authorities it is foolish to waste time going elsewhere for attention.

Dr. Peabody then shows the fallacy of this reasoning. Never, he says, was the sound general practitioner more important than he is today. Never was the public in need of wise, broadly trained advisers so much as it needs them today to guide it through the complicated maze of modern medicine. In fact the very factors that are creating specialists in themselves create a new demand for men who are in touch with many lines.

The advantages to be derived from treatment by specialists are entirely obvious, Dr. Peabody says, but man is not merely an aggregation of organs or systems—he is first of all a human being whose proper care involves an appreciation of his body as a whole, together with the circumstances of his life.

Many a sick person, after visiting a series of experts and being treated for the abnormalities that each discovered in his own sphere, remains an invalid because none of his doctors was accustomed to look at a case as a whole. Like ships that lack a guiding hand on the helm, these persons swing from tack to tack with each new gust of wind, but get no nearer the port of health because there is no pilot to set the general direction of the course.

Pacific and Atlantic

BABIES AT SEA

These babies, accompanied by their mothers, enjoyed a blissful release from the drudgery and squalor of New York's poorer sections when they sailed one day last summer for a cruise on the floating hospital, *Helen C. Julliard.*

Wide World

INSULIN KEEPS THEM WELL

Insulin maintains these children in health in spite of the fact that they have diabetes. They are shown receiving their daily injections at a summer camp near Cleveland, especially for diabetic children.

Pacific and Atlantic

SURVIVORS OF THE RECENT ITALIAN EARTHQUAKE, homes demolished, begin life over in emergency tents.

Henry Miller

TRAINING BRITISH NURSES

Members of the British Ambulance Corps of Women are given thorough training in first aid work under all conditions. An injured patient is being carried from a first aid station during a gas attack.

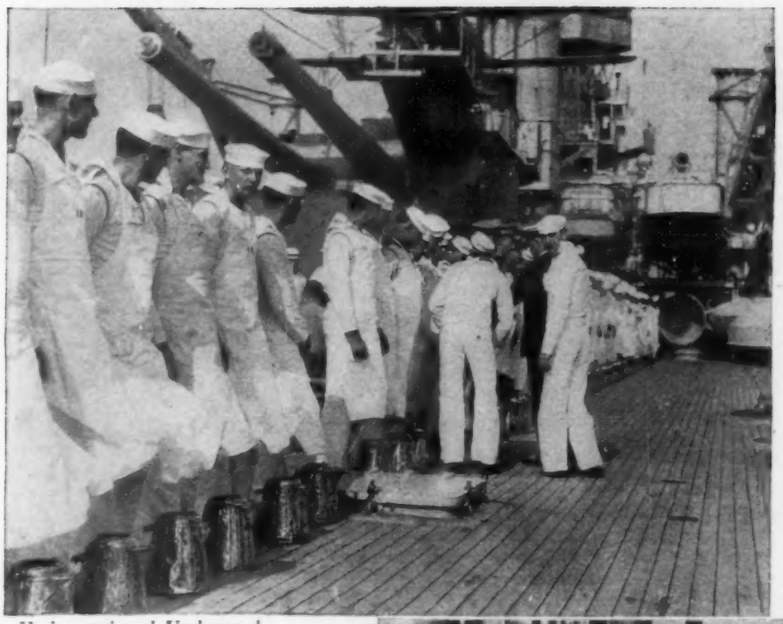
SCIONS OF BRITAIN

England is proud of its royal family and the newest generation bids fair to equal its elders in charm. These attractive chaps are Viscount Hubert H. Lascelles and his brother, Hon. Gerald David Lascelles, sons of Princess Mary and the Earl of Harewood.

Underwood and Underwood

A FLOATING SCHOOL FOR CHILDREN OF BARGE OPERATORS has been established on the Grand Union Canal in England.

Herbert Photos



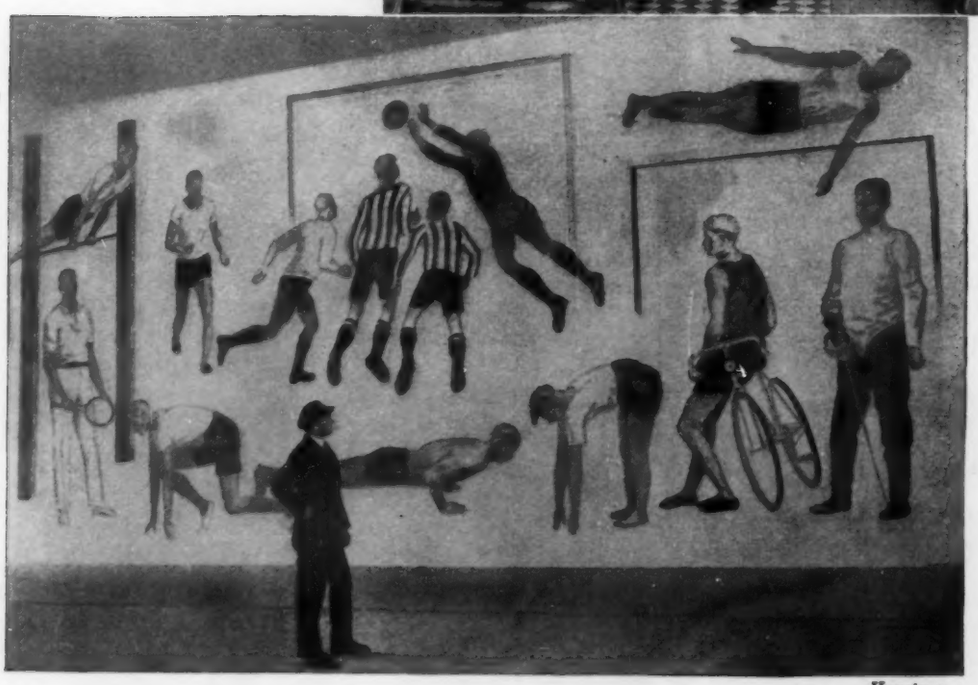
Underwood and Underwood

COFFEE POTS AWEIGH!

Uncle Sam takes no chances with the health of sailors. Mess cooks of the *U. S. S. Arkansas* bring immaculate though sometimes battered coffee pots to the top deck for daily inspection.

QUEEN VICTORIA EUGENIA OF SPAIN VISITS A DISPENSARY for tuberculous children in Madrid.

Underwood and Underwood



Keystone

SPORTS FOR HEALTH'S SAKE IS THE MESSAGE OF THIS WALL PAINTING in the new International Hygiene Exhibition at Dresden, Germany.

The Story of April Blue

By Elizabeth Blaine Jenkins

AWAY down south in a little cabin on a big plantation lives a small black boy called April Blue. He has shiny dark eyes that twinkle merrily and a wide mouth full of white teeth. His gums are blue, and he is quite proud of them, because being a Blue Gum is quite as aristocratic as being a Rockerbilt or a Vanderfeller. It meant that his ancestors belonged to the nicest families in the jungle.

April had a nice mammy called Maum Jessamy, and a "sis' " called Early Bell and a big "brudder" called Buck. April was called that because he was born on a bright blue day in April—any one might guess that. Early Bell was born when the plantation bell was ringing for "gitten-up" time, and some folks might guess that. Buck was called Buck for no reason at all except that he had to have a name, and he was the oldest of Maum's children.

Every day Maum worked at the Big House, cooking for the white folks. Early Bell stayed at home and baked "cohn" bread in a big black skillet, used the sedge broom to sweep up ashes, and made the beds with the big red and blue and yellow quilts. This was summer time, so she did not go to school but just played down in the rice field until mammy came home at evening time. Maum always brought warm rice and grits and tidbits of white folks' food and with her three black "chillen" sat before the bright pine wood fire. They had a wonderful time eating tidbits before they went to sleep.

It was nice hot summer time when this story began. The blackberries were ripe, the red birds were singing in the live-oaks, the mocking birds were warbling to the stars.

One morning the three little black children were sunning themselves and poking a lizard with a broom straw. They said: "Lizzie, Lizzie, stick out yo' blanket."

Right in the middle of a mud puddle stood old Mr. White Mule.

The lizard would puff out a little balloon that came from under her chin. Just as Lizzie stuck out her blanket for the fourth time, Maum thrust her kinky head through the window and said: "You-all lef' dat Lizzie mine its own business, and go to gran's house an' fotch goobers. Gran say to ax she fo' goobers to mek a sweet cake."

Buck grinned happily and stuck out his orchid-colored tongue as if he tasted goobers. He slid off the step before Early Bell could say, "Kin I go too, Mammy?"

Maum shook her broom at Buck and said: "Mind what I done tole you 'bout bein' keerful. Little chillen that don't be keerful gits run over by autos an' stepped on by white mules an' drown-dead in back-water an' bite by black-snake. Ef-n you don't be keerful I'se goin' chastise you turrible!"

Now Buck didn't like to be careful. He liked to see how near to the water he could walk without falling in. He liked to hang upside down from the live-oaks and peep through the gray moss at the sky. He skipped along to gran's house, wondering what he could do that wasn't "keerful." When he came to the big road that crossed the rice field, where the autos whizzed by, he galloped across right in front of one. He felt the hot air rushing about his ears as the auto sped onward, but he just kicked up his brown heels, and hee-hawed, pretending that he was a mule. Then he galloped along the slippery rice field path, slapping his big brown feet in the shiny puddles. He came to a low place where the water trickled over the slippery path, trying to find the other side. Right in the middle of a mud puddle stood old Mr. White Mule.

"Git—on! Hi—yo, ole mule!" shouted Buck.

"He-haw!" replied Mr. Mule.

Mr. Mule just stuck one ear up and one ear down and

wouldn't move at all. Buck forgot what Mammy said about being "keerful." He grabbed Mr. Mule's long ear.

"Don' h'ist yo' years at me!" said Buck, as he slapped Mr. Mule's jaw. Mr. Mule snorted and kicked and butted, all at the same time, and before Buck could say "Clare to gracious," Buck and Mr. Mule tumbled into the warm, lazy water. They swallowed lots of water and some pretty green duckweed. Buck almost swallowed a little brim fish, which thought Buck's mouth would make a nice hiding place. Buck had to hold to something so he grabbed Mr. Mule's tail, and Mr. Mule pulled him out. There he sat on the rice field path, with his new overalls very wet and the water dripping off of his nose and ears and chin.

"What I'se goin' do now?" he said, as he crawled under an ishy-berry tree and spread himself out to dry. He sang dolefully, "Ma'y don' you weep no mo'! Pharaoh's army got drown-dead!" and hoped he would dry off soon.

Pretty soon Early Bell came along. She was on her way to gran's house to find out why Buck didn't bring goobers home. She had been very "keerful." When she crossed the road where the automobiles whizzed by, she waited until all the autos were far away, then she ran across in a hurry. When she met Mr. Mule she said: "'Scuse me, Mr. Mule!" and walked around him, on the side farthest from his heels. When she met Buck she looked at his wet overalls and said: "You'se aint been keerful!" She ran along fast, so Buck wouldn't dry off before she could run to gran's house and get the goobers for a sweet cake.

Early Bell walked carefully through the briar patch, so she would not get a thorn in her foot. She walked around the oats patch so she wouldn't step on a sassy blacksnake. She didn't throw sticks at Ma pig, to hear her squeal, or pull old nammy cow's tail. She was almost as far as gran's house when she came upon Daisy Anne fishing for brim fish. Early Bell stuck her tongue in her cheek, rolled her eyes wisely, and said: "Ef'n you'se let me fish, I'se'll kotch a big grandaddy brim fish dat will stick out yo' skillet bofe ways!"

Daisy Anne thought that would be a very nice brim fish, so she gave her long cane pole to Early Bell and sat down to watch her catch a grandaddy brim fish. Early Bell swished the line into the water just as gran did, and, poof! it wouldn't come out! She pulled harder and harder, and squealed; "Dat is de biggerest brim fish what I tole you I'se goin' cotch! Dat is grandaddy brim fish, as shore as you' bohn!"

Just then two big google eyes, a long horny nose and a wide, wide toothy mouth opened, and Daisy Anne shrieked: "Dat is 'gator what you cotch, sho as jedgment! Run an' save yo' skin!"

Early Bell tumbled over backward, and the hook flew out of the alligator's claw and hooked itself into Early Bell's little black toe. Early Bell held her toe and shrieked some more, while Daisy Anne ran to mammy's house and gasped:

"Early Bell fish for brim and cotch a big 'gator!" Mammy's eyes looked big chocolate pies, as she said: "Is you been crazy?"

Then mammy began to think and think, until she almost guessed exactly what happened. She shook her broom at Daisy Anne and said: "Didn't I tole Early Bell to be keerful?"

Daisy Anne didn't like mammy's gleaming eyes one bit, so she flew for home as fast as her little brown legs could carry her.

Mammy's eyes looked like the sky before a storm, dark with red lightning in the corners. She called April Blue.

"April Blue, listen wid your ears. Buck an' Early Bell aint fotch goobers 'case dey some place not bein' keerful. You go to gran's house and fotch goobers or I chastise you wid an ishy-berry stick. When I sez goobers I means goobers—I ain't mean 'gators neider brim fish."

"Early Bell fish for brim fish and cotch a big 'gator."

April Blue knew all about ishy-berry sticks. He knew what chastising felt like, so he walked "keerfully" out of the yard and turned his nose toward gran's house. He meant to get those goobers for sure.

April Blue walked as "keerful" as a fox snooping around gran's chicken coop. He was as keerful as a 'coon when he smells houn' dog. He looked both ways for autos. He 'scused himself around the white mule on the safe side. When he came to Buck, who was still sitting on the rice field path drying his overalls, April Blue turned his shiny black eyes straight ahead just as if he did not see Buck and sang solemnly:

Seek, seek, seek an' ye—shall—find,
Knock, knock, knock an' de do' shall be open',
Ax, ax, ax an' it shall be given
W'en de love come trickelin' down!"

He tiptoed through the briars; he walked around the pig-lot; he didn't step on blacksnakes. When he came to Early Bell, who was

still holding her toe, he looked straight ahead and sang solemnly:

O, sistah, yo—oughta—been—dere.
O, sistah, yo—oughta—been—dere.
O, ho—ho—sistar, yooughtabeendere
W'en de love come trickelin down!

Then April Blue walked on toward gran's house, which was peeping out from under an old live-oak tree.

Gran gave him a smile and a piece of bene' candy and a dish of cane 'lasses and a big basketful of goobers. April Blue walked "keerfully" home, and didn't do one "keerless" thing.

Gran gave April Blue a big basketful of goobers.

Mammy made a big sweet smelling goober cake. Buck smelled it and came creeping home, hoping mammy wouldn't see how wet he had been. Early Bell smelled it, and she crept home too, hoping mammy wouldn't see that she had pulled a fish hook out of her toe. She peeped in at the bedroom window and saw the ishy-berry stick behind the little cracked mirror. Then she pulled it out and hid it in the wood pile. Buck covered it with a piece of fat-wood, then they both peeped in at the kitchen window and sniffed longingly at the goober-cake smell.

Mammy saw Buck and Early Bell peeping in at the window, and she said: "Jest wait 'twell I find my ishy-berry stick and I'se'll teach yo' to be keerful an' fotch goober 'thout cotching 'gators an' spilin' yo' Eastah pantses."

She looked under the bed and behind the clock and back of the stove and couldn't find the ishy-berry stick, because it was in the wood pile, where Early Bell had hidden it.

Early Bell said: "Mammy, I'se'll sho' be keerful, an' nevah cotch 'gators wid fish hook again ef'n you don' look no mo' for de ishy-berry stick."

Buck said: "Mammy, I'se'll be awful keerful. I'se'll look for autos and w'ite mules and everyt'ing that kin run over youse or kick youse or bite or sting or tromp on youse."

"Or stick in your toes!" said Early Bell when Buck stopped.

"Ef'n yo' don't 'member," said Mammy, "I'se'll chastise youse wid de bigges' ishy-berry stick dis side Jerden."

Mammy's three little black "chillen" had seen mighty big ishy-berry sticks on this side Jerden, so they promised to be careful all the rest of their lives. They ate goober cake while the frogs sang in the rice field and the old whip-poor-will began to say "Pick chips out de white oak!" to the warm southern moon.

April Blue got an extra piece that was left, because he was the "keerfulest" of mammy's three little black children, when he went to gran's house to fetch goobers.

A Bright Saying

A BOY, 7 years old, was recovering from a serious operation. Accompanied by his mother, he came to the clinic for a dressing. While waiting his turn he sat studying "The Execution of One of the Early Kings," an immense picture across the hall. When he asked his mother what "execution" meant, she plainly told him, "cutting off one's head."

"But, mother, they gave him gas, didn't they?"

G. F. ANDERSEN.

The Jolly Smiles Crew

By Wanda B. Longacre

CHARACTERS

CAPTAIN, a fine, upright fellow with cheerful countenance and a commanding air.
TOFFY, who has very white teeth of which he is extremely proud.
BUMPER, a plump, healthy pirate, greatly interested in food.
ONE-EYE, who has black patch over the right eye, as a result of a terrible combat with the Mosquito Army.
NOBS, a healthy fellow, who is always happy and smiling.
PILOT
CABIN BOY
THE PRISONERS
JOE DIRTYFACE
SAM EATSWEETS
MARY LATE-TO-BED
GUS GLOOMY
SUSY DOOLITTLE

Act I

SCENE: The Captain's cabin of a pirate ship. The cabin is plainly furnished with desk and a few chairs. It has two doors, one at the side and one at the back of the stage.

Four pirates are gathered around the Captain, who has his feet on the desk. The pirates wear bandannas on their heads, gay scarfs for sashes, and have knives stuck in their belts. They are clean and gay. The Captain wears a bandanna, earrings, a gay sash and a sword. The ship and the pirates are clean, contrary to all theories concerning pirates. The method of saluting on board the ship is smiling.

CAPTAIN: Well, men, that was a good haul we made last week.

NOBS: Aye, sir, but that big landlubber was a hard one to handle.

ONE-EYE: He was all of that, but he's cheerful enough now, sir, since we scrubbed him down. *(Others nod agreement.)*

CAPTAIN: We must be on the lookout for more prisoners. We can't waste too much time.

TOFFY: One of the prisoners told me, sir, that a ship crowded with people from the Dark Island will pass through Gloomy Straits tomorrow.

BUMPER: That's right, sir, the prisoners have been talking about it.

CAPTAIN: Well, this is interesting. We must change our course at once. Nobs, have the pilot report to me immediately.

NOBS *(saluting and turning to the door):* Aye, aye, sir. *(Exit Nobs.)*

ONE-EYE: We have room for only a few more persons without crowding. What shall we do, sir?

CAPTAIN: We'll see how many are on board that ship. If there are more than we can handle, the dirtiest ones shall be chosen and brought aboard, the rest we leave to their fate.

ONE-EYE: All right, Captain.

CAPTAIN: How is your squad making out, Bumper? Any trouble?

BUMPER: There was a little yesterday, sir, when one of the prisoners refused to wash his ears. I ordered one of my men to scrub them for him and he didn't miss a single twist. That prisoner won't do it again! The rest of the crowd seem rather to like it by now. Much more cheerful already, Captain.

CAPTAIN: Fine work, Bumper. We'll have these prisoners smiling yet. *(A knock on the door.)* Come in. *(Nobs enters with the pilot, who is a tall, strong fellow with an air of alertness.)*

PILOT: You wanted me, sir?

CAPTAIN: Yes, we must be at the Gloomy Straits by noon tomorrow. Change our course to nor' by nor' east.

PILOT: Aye, aye, sir. *(Salutes Captain and goes out.)*

CAPTAIN *(knocking on desk three times):* Let's have a drink, men, to a successful fight tomorrow.

ALL: Fine, sir. Aye, aye, sir. That's it, sir. Great, sir. *(Cabin Boy enters through back stage door. Salutes Captain.)*

CAPTAIN *(with generous wave of the hand):* Bring up two bottles of the very freshest milk and issue drinks to the crew. *(Boy disappears. Pirates talk among one another while Captain gets glasses from the drawer. Boy enters with two bottles of milk.)*

CAPTAIN: Here, men, fill your glasses to the brim. You, too, Boy. *(Fill glasses. All raise glasses.)*

CAPTAIN: Here's to a happy ending. *(All drink heartily.)*

NOBS: How about a song, Captain, to get us ready for tomorrow?

CAPTAIN: Just the thing. What'll it be?

ALL: Our Pirate Song.

CAPTAIN: All right, then. Here goes. *(All sing lustily, including the Cabin Boy. Words are sung to tune of "Pop Goes the Weasel.")*

Fifteen men with massive chest—
Yo—ho, and a bottle of milk.
Sleep and vegetables cured the rest—
Yo—ho, and a bottle of milk.

(Curtain goes down as they repeat it. They form a line with the Captain in the center, each placing a hand on the shoulders of the man on either side.) [CURTAIN.]

Act II

SCENE: Same as in Act I. It is the following afternoon, after the battle. The Captain and the pirates are stern. The Captain is sitting at his desk. Nobs, Bumper, Toffy and One-Eye are standing, along with as many more pirates as desired. Nobs is at the right of the Captain, taking notes in a small notebook. Bumper is at the side door lining up the prisoners. Toffy is at left of the Captain, ready for orders. One-Eye is between the desk and Bumper, moving the prisoners along and pushing them up to the desk. There are three boy and two girl prisoners. All are sullen, dirty and slouchy.

CAPTAIN: Be sure to take careful notes, Nobs. We may need them later on. *(Turns to captives)* You, there, the first one, step up. *(Bumper gives the prisoner a shove.)*

CAPTAIN: Name?

PRISONER *(with eyes downcast):* Joe Dirtyface.

CAPTAIN *(looking at the prisoner):* Humph! Certainly fits. What do you do for a living?

PRISONER: Sell rags.

CAPTAIN: That's all. Toffy, turn him over to the Scrub-Down Squad. *(Toffy takes the prisoner out the back stage door. Returns to the desk. The Captain calls the next prisoner.)*

CAPTAIN: Next. Name?

PRISONER *(rather plump and untidy):* Susy Doolittle.

CAPTAIN: Fine way for a young lady to look! What is your present occupation?

SUSY: None.

CAPTAIN: We'll soon cure that. Toffy, she goes to the Exercise Squad. *(Toffy escorts her to the back stage door.)*

CAPTAIN *(in the meantime):* Next. Your name and occupation?

PRISONER: Sam Eatsweets and I work in a candy store. Candy beats vegetables all hollow.

CAPTAIN *(angrily):* That will do. Answer only what you're asked. Humph! Doesn't look as if candy did much good for you. Toffy, he goes to the Food Squad. *(Toffy leads him out.)*

CAPTAIN: Next. Your name?

PRISONER: Mary Late-to-Bed, and I go out a lot at nights.

CAPTAIN: You certainly don't look healthy. Guess you'll come around, though. Toffy, the Sleep Gang. *(Toffy leads her out.)*

CAPTAIN: Next. My, I'm glad this is the last one for today. These prisoners are so ugly. *(To prisoner)* Name?

PRISONER: Gus Gloomy, and I make people frown.

CAPTAIN: Oh, you do, do you? Well, we'll soon change that. No gloomy ones stay around us long without learning to smile. Toffy, the Smile Squad for him. *(Toffy takes him to the door.)*

CAPTAIN *(giving sigh of relief):* Glad that's over. Get all the notes, Nobs?

NOBS: Aye, sir, and they are a bad looking bunch. That gloomy fellow is a tough one.

CAPTAIN: Oh, he'll come around all right after he gets acquainted with Good Habits. This certainly is no easy job, trying to make people find Smile Land. What say, men?

TOFFY: It's a hard job all right.

CAPTAIN: Let's call it a day, men. We've got hard work ahead of us. *(Pirates start for door, Captain rises and slowly stretches.)*

[CURTAIN.]

Act III

SCENE: Same as in Acts I and II. The four pirates, Nobs, Toffy, Bumper and One-Eye, grouped carelessly around the room, are waiting for the Captain to appear. The time is one month later.

BUMPER: It's been one hard month, men, but I think it's worth it; how about you?

NOBS: I'm with you there, Bumper. When I saw those prisoners for the first time it seemed hopeless, but they certainly have improved.

That Gloomy fellow is getting to be a regular clown.

TOFFY: And that Eatsweets is looking much better since he's been on the Vegetable Diet. It doesn't even seem to hurt him to smile, any more.

ONE-EYE: As for me, I'd say that the prisoners have improved a lot, but what really puzzles me is how the Captain can work so hard and still be as happy and healthy as ever.

TOFFY: Oh, that's easy. He was introduced to Good Habits when he was very young, and it has influenced his whole life. That's what really made him start on his pirate career on the ship *Jolly Smiles.* He felt sorry for the people on Dark Island and this was the only way he could find of helping them. They wouldn't listen to any one that just talked to them.

BUMPER: Well, it's lucky for us he decided to be a pirate. Think of the good fun we would have missed. We all would— *(All four jumped to attention as the Captain opens the door and walks in. All salute him. The Captain returns the salute and walks over to his desk, seating himself. All seem happy and alert.)*

"Let's have a drink, men, to a successful fight tomorrow."

CAPTAIN: Well, men, it's time we had prison inspection. Bring in the prisoners. *(Bumper goes to the door and opens it, motioning to some one outside. Toffy is at the left of the Captain, Nobs at the right, One-Eye at side of the room. The prisoners file in and stand on either side of the desk. All are clean, erect and smiling. The Captain looks them over.)*

CAPTAIN: Well! Are these the prisoners we seized a month ago? What a change! Dirty-face is all cleaned up. Susy Doolittle is looking fine—as if she had enough exercise. Sam Eatsweets looks in good condition and Mary Late-to-Bed has lost those rings under her eyes. And this—is this Gus Gloomy? Well, you certainly are a changed man! You prisoners are cured, from all I can see; don't you think so, men? *(All the pirates nod assent.)* I hereby declare you free people; see that you stay free from Bad Habits. His stepbrother, Good Habits, is much better company.

GUS: Please, Captain, won't you change our names? We don't like them any more *(prisoners all nod "yes")* and we hoped you would change them.

CAPTAIN: Hm—m! So that's the way the wind blows. Well, that's a just request, and I see no reason for refusing it. Think hard, my pirates, and see what can be done about this. *(A few seconds of silence while every one concentrates. The prisoners look hopefully at the pirates.)*

BUMPER: I have it, Captain. How about changing one syllable in their last names. That ought to work out.

CAPTAIN: That's a good suggestion. Let's see. Joe would then be Joe Cleanface. That would make Susy Miss Domuch. Susy, hereafter you shall be known as Susy Domuch. This is great, men! Now Sam would be Nosweets and Mary would be Early-to-Bed. Hereafter you shall be known as Sam Nosweets and Mary Early-to-Bed. But the problem is what to do about Gus Gloomy. That's a sticker. Wait, I have it! Gus will hereafter be known as Gus Smiles. *(Much clapping and cheering.)*

TOFFY: Captain, let's sing our Pirate Song for the ex-prisoners.

CAPTAIN: That's the idea! Come on, men. *(Pirates sing the song once. The second time the ex-prisoners join in.)*

Fifteen men with massive chest—
Yo—ho, and a bottle of milk.
Sleep and vegetables cured the rest—
Yo—ho, and a bottle of milk.

[CURTAIN.]

HEALTH *and the* SCHOOL

Edited by J. Mace Andress, Ph.D., 67 Clyde Street, Newtonville, Mass.

Adventuring in Europe

FOR two months and a half the editor of this department has been a pilgrim in foreign lands. Half a dozen countries of Europe were visited. One of the first questions leveled at me when I stepped off the boat on American soil was "Did you make a school health study abroad?" I did not. I tried to cut the anchor which connected me with my regular vocations and surrender myself unreservedly to the spirit of play. The postoffice was not given any forwarding address, and no volumes on health were included in my limited baggage. I tried to be a healthy human being with no especial interest except that of enjoying the longest vacation of my life. Some of my journeys were along the conventional lines of travel while others were in sequestered paths little frequented by tourists.

Europe was fascinating. It was like living one's childhood over again. Every day seemed to be taken from a living story book in which there were castles, cathedrals, palaces, kings, queens, knights, peasants, goose girls, goats, thatched cottages, country dances and yodelers, with the important difference that the people in the story book actually moved and spoke. Yes, and at times they seemed to be a little puzzled and even amused when one tried to converse in their language.

Little Unplanned Journeys

Of all the little journeys the unplanned ones were best. The most precious days were those in which my wife and I picked up our walking sticks early in the morning and started along the broad highway courting adventure wherever we might find it. Often we passed through quaint villages which seemed to be just as primitive as those in the middle ages. We saw perhaps on the main thoroughfare a rambling old house close to the street, brilliant colored flowers in the window boxes and lace curtains in the windows. Right next to the window with lace hangings there might be a compartment for cows. The pungent odor of manure often assailed one's nostrils.

Often we took an out-of-the-way path through the fields where we saw peasants working as if entirely

By Burton Holmes from Ewing Galloway

The chimney sweep is still popular nearly all over Europe.

oblivious to the much talked of machine age. There was meditation in ancient chapels, reading of historical inscriptions, making purchases at little shops, eating at roadside cafés where no English was spoken, joining a little group at a market in the village square, visiting a school, sipping tea in the afternoon and listening to airs from great operas. Often there was the inspiration of mountain scenery where high above the treetops glaciers and lofty peaks of eternal snow were so resplendent in the evening sunset that one paused speechless in adoration.

Professional interests could not be kept entirely in the background, however. As a traveler and would-be vagabond, I found a keen interest in the conditions and customs affecting healthful living. What follows is not in the nature of a scientific study, but the result of some thoughtful though cursory observations abroad.

It was evident that Europe like any other section of the world has its advantages and disadvantages from the point of view of hygiene. One of the impressions made upon the casual American traveler is the lack of certain personal habits of hygiene which we in America look upon as fundamental in healthful living.

The common drinking cup is found everywhere. It is almost unbelievable that the countries that produced such great health heroes as Pasteur and Lister should tolerate this public nuisance. Many of the common drinking cups are chained to the fountains. Right in front of the British Museum I saw such a cup and a group of street children dawdling over it.

The unspeakable roller towel is so common in public places that when one finds individual towels it is such a rare event that he remembers it. Frequently no towels are supplied in toilets on trains or else there is the roller towel.

I was informed by an American scholar who was making a study of industrial hygiene in Europe that the common drinking cup and roller towel were universally in use in Europe.

Habits of handling food are objectionable. Flies and dust apparently have no terrors for the great mass of Europeans. Food is not covered with glass or paper as it generally is in this country. This is especially true of bread. It is not unusual to see loaves of bread piled high in a basket on the street in front of a shop or to see a laborer in his work clothes going home with a long loaf of bread tucked under his arm.

Schools Backward in Health Teaching

Few schools could be visited, but we missed everywhere in Europe the splendid hygienic school buildings found in America. An examination of school texts shows that whatever instruction in health is given is rather dull and dry, much space being devoted to anatomy

and physiology. The many attractive texts used in America are not seen. In one of the most important countries of Europe I found that there was absolutely no place in the course of study for textbooks on health, and none were in use even incidentally.

During the entire trip abroad there was only once that I saw anybody drinking milk. That was in Germany, where an attractive public milk station helped encourage children to drink milk. The customs of Europe make milk and water drinking difficult if not impossible. The drinking of liquor at meals is universal. Servants get tips from the sale of wines and beers and nothing from serving water. When the water is served it is not ordinarily cold, and the idea of buying milk as a drink has apparently not occurred to the European. The American custom of drinking water and milk at meals stands out in marked contrast to European habits.

The driving of automobiles seems more reckless than in America, but accidents are not so common because there are fewer automobiles. Except in the large cities and on the main routes of travel one may walk in the middle of the road without much annoyance. Sometimes a half hour may pass without one's seeing a single automobile. As automobiles increase in number in Europe it is probable that more efficient laws will be formulated.

In some respects Europeans surpass Americans. Generally the streets are cleaner. This was particularly true in Germany, where cans for the collection of rubbish are usually found on street corners. Pedestrians seem so well trained that it is rare indeed that any one is seen throwing anything on the sidewalk or into the streets. These are habits that we in America might emulate with profit.

Outdoor mindedness is one of the striking characteristics of Europeans. Everywhere people are outdoors. Walking is a universal habit. Along the broad highway one meets families, walking sticks in hand, out for a hike or climb. Old and young participate. Companies of school boys and girls with their instructors are frequently seen. With tanned faces, arms and legs, strong muscles, bright eyes, knapsacks on their backs, they march along the streets singing stirring songs. On their trips they may visit historic scenes and places of educational interest. When they get back to their classrooms they have vivid experiences to report and a keener appetite for reading.

In relaxation Europe seems far ahead of America. One misses the hurry and wear and tear of American living. Often it is annoying because the traveler finds it difficult to adjust himself to a world in which hurry seems unknown. Think, for example, of a business man stopping his work and sometimes even closing his shop or office to have a cup of tea. Eating and drinking in Europe are always more than mere physical or physiologic processes. They are opportunities for rest, relaxation, conversation or listening to music. The quick lunch is unknown in Europe. "Pep" is almost a disease in America. In a land in which hours of leisure are steadily increasing we need to teach the art of relaxation as a health objective.

Among the wholesome interests that Europeans have is that of creating and enjoying beautiful things. They live in lands famous for picture galleries, great music, fine art and literature. The appreciation of beauty is almost second nature to them, and even the humblest individual enjoys the creation of beauty. Lawns, as we know them in America, are almost unknown, except on great estates, but in a peasant village one finds gorgeous flowers in window boxes and every inch of space in front of the house utilized for flowers. One of the lovely pictures that every traveler in England must carry away in his soul is that of the English gardens. Jazz, although slowly invading Europe, is rarely heard. In even the most out-of-the-way place one may linger in a café and hear the best of music. This universal interest in the beautiful cannot but enrich mental life.

Europe has much to learn from America concerning practical hygiene and America in turn may profit from the health achievements of Europe.

J. M. A.

"Come, butter, come." The first grade takes up churning.

A PRACTICAL LESSON ON BUTTER MAKING

THE project described here is adapted to the primary grades and was successfully used last spring by a 1B group.

Objectives:

To have the children realize that butter is made from milk.

To teach them to like the flavor of butter.

To teach that butter is one of the foods that make them grow.

Activities:

Make butter in Mason jars.

Give a party for parents, using the butter the class has made.

Method:

Use pint Mason jar, fill from one-third to one-half full with properly ripened cream. (Directions for this project are given in description which accompanies this outline.)

As this constant shaking is tiresome, let the children take turns.

Six jars passed from child to child will be sufficient for the class. Use 2 quarts of sour cream.

Points in Successful Buttermaking:

If possible, it is a wise plan to obtain properly ripened cream from a creamery near the school.

The best temperature for the cream is from 50 to 55 F.

Use a dairy thermometer.

Proper temperature is a most important item in successful buttermaking. Too cold cream takes long; too warm makes a greasy butter.

If the cream is the right temperature, from 35 to 40 minutes is required.

If the cream stands at a low temperature for a long time it is difficult to make the butter come in the given 35 to 40 minutes.

When small granules of butter appear (they should be about the size of a wheat grain), pour off the buttermilk.

Keep the butter in the jar and have the children work out the surplus buttermilk in cold water.

Add salt in the proportion of about one-fourth of a teaspoon to the product of half a half-pint jar of cream.

Keep the butter cool until it is ready to use.

During the spring we had worked out a farm project. Then as a culmination of this, we had discussed milk and its products. When we spoke of buttermaking, the children were eager to make some. The next day I brought two quarts of good cream. Two little girls brought toy churns from home.

First we talked about the condition of the cream for churning and then the different ways of churning: dasher churn, barrel churn and "a big machine churn," as one little boy whose father works in a creamery expressed it.

We had six pint Mason jars besides the two toy churns. These the pupils washed in warm water, filled half full of cream and then took turns at shaking the jars and working the dasher in the churns, saying as they did this—an old folk verse:

Come, butter, come
Come, butter, come
Johnnie's at the garden gate,
Waiting for a buttered cake,
Come, butter, come
Come, butter, come.

The pupils were delighted when they saw the cream changing in the jars. I asked what to do next, and some one said, "Pour off the buttermilk." We did this and washed the butter many times. Then we worked in the salt and tasted it again.

We folded paper cups and tasted the buttermilk. Some liked it and some did not. Our butter was placed in the icebox, as we decided to use it at our mothers' party on Friday.

In the afternoon reading class, we decided it would be nice to make a lesson about butter churning for our health book. The following lesson was made:

We churned butter.
First we washed the churn with hot water.
Then we poured the cream into the churn.
We worked the dasher up and down.
We said:

Come, butter, come
Come, butter, come
Johnnie's at the garden gate
Waiting for a buttered cake,
Come, butter, come
Come, butter, come.

Soon we had butter.
We poured off the buttermilk.
We made paper cups and tasted the buttermilk.
Then we washed and salted the butter.
We tasted the butter.
It was very good.

I printed this on paper 12 by 18 inches for our health books. It made three pages, I also printed the lesson and cut it into phrases to use in building the lesson on our cardboard chart.

The project culminated in furnishing refreshments for the mothers' party. These parties are a favorite plan of the primary teachers for connecting up the home with the classroom. The trouble, they feel, is more than compensated for in the mutual understanding promoted. The parties are likely to feature some healthful item of the dietary which is not altogether appreciated. Carrot parties, spinach parties, cottage cheese parties, cereal parties and lettuce parties are frequently encountered.

As we were to have a program and party for our mothers Friday, May 9, we planned to save our butter for that event.

Cover of a first grade party invitation. It was done in pink and green crayon.

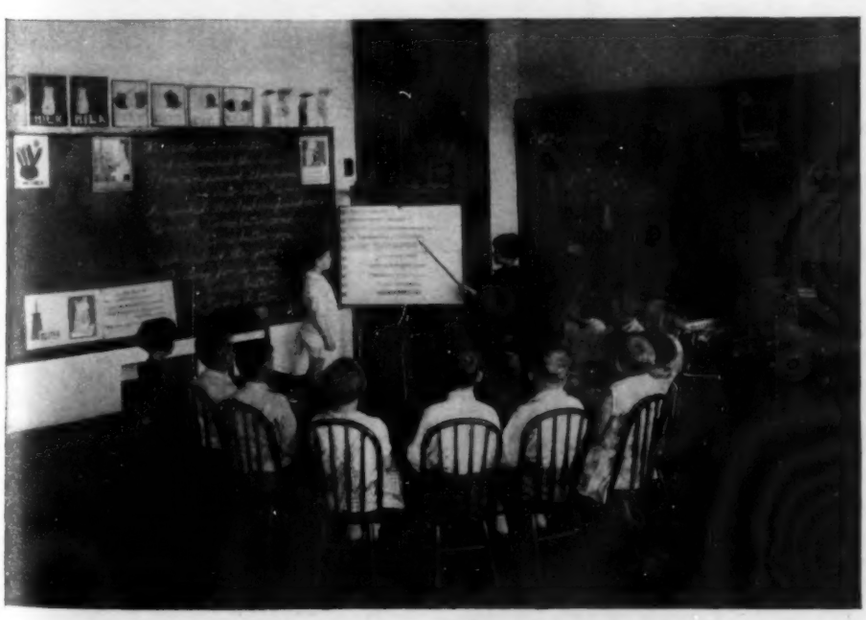
Invitations were designed by the pupils and a little hectographed rhyme was pasted inside:

Dear Mother Mine,
Pray come on time
On Friday afternoon;
To see us work,
And play that day.
2:30 — 3:30.

Napkins, aprons and head bands for the waiters and favors for the mothers were made by the pupils. Carnations, being the mothers' flowers, were used in the decorations.

For refreshments we had brown bread sandwiches, spread with our freshly churned butter and a dandelion filling. We had been stressing the use of greens, and as dandelions are delicious at that time of the year, I had told the pupils about a dandelion salad to be made of cut dandelion leaves, grated carrots and finely cut onions, seasoned and mixed with mayonnaise dressing. This, we decided, could be used as a filling for sandwiches. The pupils brought the dandelions and cleaned them the previous afternoon. The greens were then left in cold water over night. In the morning the dandelions were cut, the carrots grated and the onions cut. These were put in the icebox. At noon the ingredients were mixed with mayonnaise dressing. Some junior high school girls helped us spread the sandwiches. As a special treat we had strawberry Dixies.

The program was mostly work that had already been learned, so as not to make an extra strain on the pupils. Health exercises, songs and rhymes taught during the year, a bird exercise and songs with some special exercises, poems and songs about mother were used.



A reading lesson developed around the butter churning.

Three girls and three boys were waiters. They wore the aprons and head bands that had been made for the occasion and served the refreshments.

The mothers greatly enjoy a little affair like this and it affords endless enjoyment for the pupils as well as helping to instil the habits of health and politeness.

KATIE M. LOBBEN,
Fargo, N. Dak.

Correction.—In the October number of HYGEIA the price of "Boyways" by A. E. Hamilton was erroneously quoted as 50 cents. The book sells for $2.50.

NEW HEALTH BOOKS AND TEACHERS' MATERIALS

THE American Child Health Association has rendered a distinct service to health education through its conferences. In the midst of a new movement that is still decidedly unsettled as to its objectives and procedures it has been worth while for the leaders in this field to get together and talk over their differences around a table and also to pool their resources. Such a conference is of inestimable value to those who are present, and a report of it should be helpful for those who could not participate in it. Stenographers were present at a recent meeting and a verbatim report[1] was made possible. This report was carefully edited.

Attention was focused on health education problems at various levels—elementary, secondary and teacher training. The student of health education who would gain a practical insight into the problems of health education today should read this volume with care.

THE realization that a health department must depend on an enlightened public opinion is shown by the publication of "The Road to Health,"[2] an unusual book which has important chapters on such subjects as "What Is Health?" "Diet and Health," and "How to Obtain Good Medical Service."

THE title of this booklet, "Safety Education in the Rural School,"[3] suggests the rapid changes that are taking place in our rural districts. Some of the great highways running through our rural sections are as crowded with motor vehicles as city streets. But it is not only on the great highways but on side streets and in regions in which there is little traffic that accidents occur. North Dakota, for example, is an agricultural state. Its largest city has a population of only 25,000. One may motor for a hundred miles across the open prairie and meet not more than a half dozen cars. Yet North Dakota in 1927 had seventy-two motor fatalities. This was a 60 per cent increase over 1924. Probably close to a half million of people are injured in rural regions every year. Such a condition demands safety education in our rural schools.

IN PHYSICAL education as in every other branch of educational work there are marked differences of opinion. Such differences indicate that in theory and practice teachers of physical education are alive and active. However, cooperation among workers and laymen can be accomplished only by some measure of agreement.

This booklet, "Girls' Athletics,"[4] is issued in response to a demand from the gymnasium and the play field that some agreement be reached as to what is good and what is not. It represents the best opinion among women leaders in physical education in the state of Ohio. It is not written entirely from the school point of view, and should be valuable not only for specialists in physical education, regular teachers and school principals but also for community organization and industrial leaders.

In this interesting publication are series of questions and answers carefully organized. The questions were gathered by carefully combing the state of Ohio for practical problems.

The character of these questions and answers may be understood by two of the questions and answers:

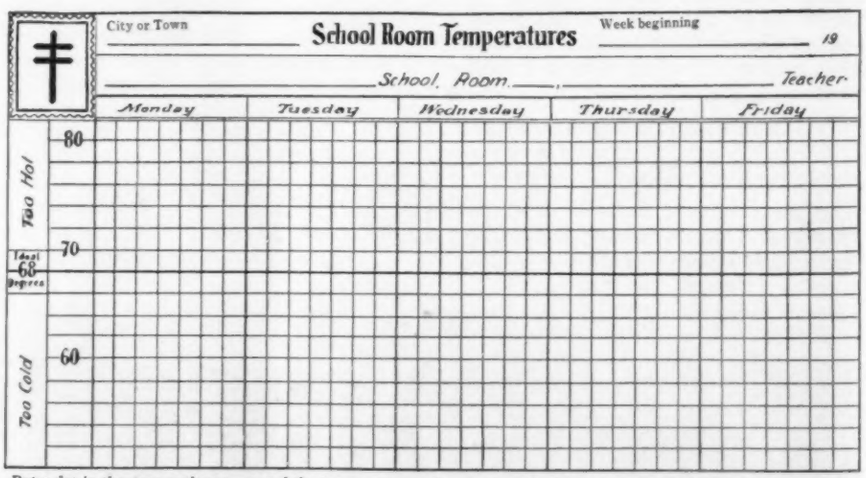
"Should academic credit in physical education be given for participation in girls' athletics?"

"Yes. Just as the study of Shakespeare counts toward an English credit, so should girls' athletics count toward a physical education credit."

"How important is winning to any school or club team?"

"Winning is the essence of the game, but winning means playing at one's best without degrading the losers. To hate the opponents, to play grudge matches, to pray for victory over a foe, to scream derision at opponents, or to feel disgraced at the loss of a game should not be a part of the winning spirit. Fair play, courtesy, self-control and generosity are as much a part of winning as a high score."

THIS is the time of the year when ventilation begins to be a problem in schools. Probably the greatest danger is in overheating. In rural schools or in other schools in which there is no mechanical system of ventilation and in which the pupils may control the room temperatures it would be well to train them to take this responsibility.



Put a dot in the proper place to record the temperature at the opening of school, and one for every hour thereafter. Connect dots by straight lines and file card in school office at end of week. Strive for the ideal, sixty-eight degrees.

MASSACHUSETTS TUBERCULOSIS LEAGUE
Health Education Department **1149 Little Building, Boston, Mass.**

One of the best ways of doing this is to have a committee keep a record of the temperature and open windows or regulate the fires in such a way that the optimum temperature may be maintained. Science has amply demonstrated that school work can be carried on with the greatest efficiency only at the proper temperature.

Those who wish to have some kind of form for the recording of school temperatures will find the accompanying one of genuine help.

1. School Health Progress. Pp. 343. American Child Health Association, New York.
2. By John P. Koehler, M.D. Pp. 85. Milwaukee Health Department, Milwaukee, Wis., 1929.
3. Suggested Topics for Safety Lessons. Prepared by the Educational Division of the National Safety Council. Pp. 38. National Safety Council, Chicago, 1929.
4. Pp. 48. Issued by J. L. Clifton, director of education, State of Ohio, 1930.

New Books *on* Health

HEREDITY AND PARENTHOOD

By Samuel C. Schmucker, Ph.D. Paper. Price, $2.50. The Macmillan Company, New York, 1929.

DR. SCHMUCKER is emeritus professor of biologic sciences at the State Teachers College, West Chester, Pa., and has already written books on "Man's Life on Earth" and "The Meaning of Evolution." In "Heredity and Parenthood," he presents a rational conception of eugenics. "No life," he states, "has realized its finest possibilities that does not include among its inmost experiences a happy marriage and some healthy hearty children." As a premise to this desirable goal in human existence, he frankly discusses the related rôles of heredity and environment. He fully realizes the importance of environment in determining the development of inherited characteristics, but he stresses inheritance.

After a consideration of the theories of heredity and their complications, he turns to the question of parenthood, and traces the increasing complexity of the sex functions from the lowest animals to man himself. There are few, if any, better presentations of the facts of parenthood. Any father or mother who reads the story of the flower, of fish and frogs, of birds and their young and of the milk-giving animals should have no hesitation in talking plainly to any boy or girl on the sex side of life. The present generation has removed the tabu on the discussion of sex and parents have the duty of providing their children with this information.

Half the book is devoted to the subject of heredity and the other half to parenthood.

The belief that man is the summit of the animal life of the earth has set us to study the lower orders of the animal world. The author reviews present knowledge of heredity and shows, to those interested in biology, the exact evidence on which this knowledge is based. In "Some Interesting Families," he reviews the effects of heredity of successive generations. Among others, he cites the case of the 1,200 members of the Jukes family, 130 of whom had been convicted of crime. The whole tribe had cost the state $1,200,000 in trials, convictions and maintenance in jails or other care, showing a part of the incalculable damage in contamination of the human strain. In "The Age of Romance," parents will find excellent suggestions for guiding their children through the tempestuous period of adolescence—the time when character gets its most important set and when idealism has its greatest appeal. Today most parents have come to believe that the teaching of sex information is necessary, but they do not know how to go about it. There are two difficulties—first, many parents have never come near enough to their children entirely to have won their confidence, and, second, they lack knowledge of what to tell the children. The first fault can be overcome by a corrected attitude of the parent himself. There is no excuse for the lack of knowledge, for the essential truths are told in this readable, helpful book. We recommend it to all parents and teachers.

CLAUDE P. FORDYCE.

HEAR WITH YOUR EYES

By M. E. Good. Pp. 40, with 32 illustrations. Price, $1. D. Appleton and Company, New York, 1930.

THIS is a handbook for the deaf. A textbook on lip-reading, it deals with the reading of word-forms on the face. To learn to read the sound from its form seen on the face taxes the memory, says the author, but the tax is not greater than that of learning the alphabet or the symbols of chemistry.

Sound and lip formations are divided into the natural classes of sibilants, consonants, vowels and diphthongs, and for each sound the author describes the exact formation of the lips. Photographs of faces with the lips forming sounds help to visualize the process, and the student is urged to practice the sounds himself in front of a mirror.

The accomplished lip-reader is so alert and accurate that a person without knowledge of his hearing defect often is quite unconscious of it until it is remarked upon. Every deafened person will find his old interests reawakened and life again a joy rather than a despair as soon as he has fully mastered the art of lip-reading.

MILDRED WHITCOMB.

HYGIENE FOR NURSES

By John Guy and G. J. I. Linklater. Cloth. Pp. 212. Price $1.75. William Wood and Company, New York, 1930.

THIS book stresses personal hygiene over the community aspect. The authors do not feel that public health subjects, such as sewage and water systems, are so important to nurses as are the selection of foods, planning the healthful home and protection from disease. Up-to-date facts are given on the commoner diseases and on disinfection. Doctor Guy is the medical officer of the city of Edinburgh, Scotland. The book is based on the syllabus issued by the General Nursing Council.

The ordinary principles of personal hygiene cover the special needs of babyhood, the pregnant woman, the school child and the individual after 40 years of age. The recent advances in our knowledge of the vitamins are included in the chapter on foods and metabolism. Some of the most valuable features of this volume are the classification of the different foods, individual safety against bacteria and the identification of internal parasites.

This book will help the nurse in her transformation of each person with whom she comes in contact professionally, to a state of hygienic living. Thus, it will also aid in her contribution to public health. No highly technical terms are used. The book can well be used as a guide to health of laymen and of nurses.

CLAUDE P. FORDYCE.

Questions *and* Answers

Cataract with Diabetes

To the Editor:—My mother has had diabetes for a year. At the onset, she noticed a decided loss of vision. This condition, she thought, would improve after she became sugar free. Her vision has steadily grown worse, although she has been on a diet. However, sugar has appeared in her urine at times, about once every two weeks. Recently her eyes were examined by a specialist, and she was found to have diabetic cataracts. Since then, she has been taking insulin, 10-0-10 units daily, and three teaspoonfuls of iodine. She has not noticed much improvement, nor has she noticed any more loss of sight. Will iodine aid in dissolving the cataracts? Will her eyesight improve if she is always sugar free? Can an operation be performed on diabetic cataracts?

L. B., Maine.

Answer.—The presence of diabetes is not a bar to the operation for cataract, provided the patient is properly treated before the operation is performed. By the use of proper diet and insulin it is now possible to make the urine sugar free and to insure the proper amount of sugar in the blood. When this has been done by a competent person and is proved by tests of the urine and the blood, it is safe to perform an operation for cataract. Many operations for cataract have been performed on persons with diabetes with entire success. As far as is known iodine is not of any help in dissolving cataract.

Tuberculosis; Meningitis

To the Editor:—1. Is it possible for one to be cured of tuberculosis if the disease is thought to be in its early stages? 2. What are some of the causes of meningitis?

L. B., Kentucky.

Answer.—It is possible for one in an early stage of tuberculosis to be cured; that is, for the foci of infection to be healed, the general health to be restored to normal and the person to be able to lead an active life.

Meningitis, or inflammation of the membranes of the brain, may be due to a number of infectious diseases; among them, tuberculosis, pneumonia, gonorrhea, typhoid fever (rarely), pus germs, and a special type of meningitis that occurs in epidemics known as the diplococcic meningitis. This last is curable by the use of a suitable serum.

Straightening Irregular Teeth

To the Editor:—I am a girl, 17 years old. I have irregular teeth. I have consulted an orthodontist and he has explained how they can be straightened, but I am still in doubt whether my teeth would remain straight afterward. The orthodontist says that after being moved the tissue would have to be built all over again. He also says that my wisdom teeth will have to be extracted if they are not growing in right. I am afraid that moving the teeth around will make them permanently loose.

L. K., Nebraska.

Answer.—The age of 17 is a little late for the regulation of teeth, but it can be accomplished under the direction of a competent orthodontist.

In making corrections of irregular teeth it is usually necessary to build or reduce certain tissues of the mouth, principally the bony ones. It is frequently necessary to extract wisdom teeth in correction of cases at this age. If the work is properly done there is no danger that the teeth will be permanently loosened.

Oranges

To the Editor:—I have heard that the nutritive value of an orange is lost if eaten with other food, that in order to get the full value of an orange it should not be eaten at the same meal with other food. Is this correct? Does other food taken at the same time reduce its value at all?

G. W. C., Indiana.

Answer.—There is no evidence that the taking of other foods with an orange impairs its nutritive value in any way.

Oranges have a small caloric value, but are of great usefulness because they contain vitamin C, the vitamin that prevents scurvy.

If you have a question relating to health, write to "Questions and Answers," HYGEIA, enclosing a two-cent stamp. Questions are submitted to recognized authorities in the several branches of medicine. Diagnoses in individual cases are not attempted nor is treatment prescribed.

Fumes from Melting Type

To the Editor:—My sister until a few weeks ago worked as a stenographer in a small printing shop. There was no partition between her desk and the rest of the plant where type is melted and where the linotype machine is operated. There is an escape pipe, but the fumes are strong. Is this injurious in any way? Would inhaling these fumes cause heart trouble?

G. R. B., Illinois.

Answer.—The fumes from melting type are acroline vapors, due to the presence of wax, fat or oils in fluxing the metals. There is no danger from the vapors of lead, as the melting point of lead is 326 Centigrade, and the vapor point is over 1,000 Centigrade, which is never reached in the melting of lead.

Acroline is an industrial poison, and the escape pipe should carry this away. Among the symptoms these fumes would cause would be nausea, loss of appetite, dizziness, headache and irritation of the eyes and skin. We do not believe that these fumes would cause heart trouble.

Books on Mental Hygiene

To the Editor:—Will you please give me a list of books on mental health?

L. E., Missouri.

Answer.—The following list of books is included in the bibliography in the chapter on mental hygiene in the last edition of the report of the Joint Committee on Health Problems and Education of the American Medical Association and the National Education Association.

"A Mind That Found Itself," by Clifford W. Beers, published by Doubleday, Doran & Company of New York City, and priced at $2. This is an autobiography, including an account of the mental hygiene movement.

"The Normal Mind," published by D. Appleton & Company, New York City, 702 pages.

"Your Mind and You: Mental Health," published by Funk & Wagnalls, New York, priced at 30 cents.

Additional information and material on this subject might be obtained by writing to the National Committee for Mental Hygiene, 370 Seventh Avenue, New York City.